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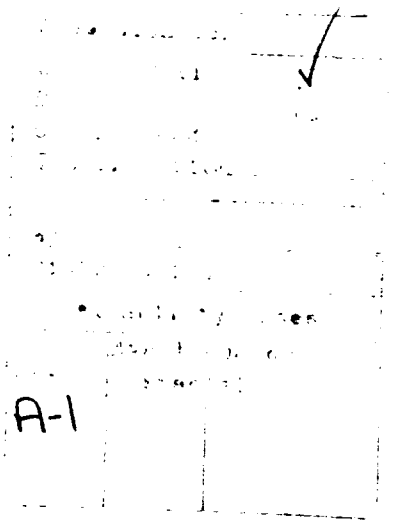

VARIABLES AFFECTING THE REPORTING OF PAIN FOLLOWING AN ACUTE MYOCARDIAL INFARCTION

by

Judith M. Schwartz

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

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May 1991

VARIABLES AFFECTING THE REPORTING OF PAIN
FOLLOWING AN ACUTE MYOCARDIAL INFARCTION

by

Judith Marilyn Schwartz

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ABSTRACT

The presence of unreported chest pain (CP) in patients with an acute myocardial infarction (AMI) has received only anecdotal mention in the literature, with the exception of one small study. Unreported CP is of concern because it is essential that the health care provider (HCP) be aware of the patient's symptoms of myocardial ischemia so that aggressive interventions can be utilized to help limit infarct size. Therefore, the following research questions were addressed: (a) Do patients diagnosed with an AMI report all instances of perceived pain? (b) What factors influence patients diagnosed with an AMI to report, or not to report, the pain? and (c) What is the process that culminates in an AMI patient's decision to report, or not report, pain? An exploratory design utilizing qualitative methodology was employed, with a purposeful sample of seven informants. Eight semi-structured interviews were audiotaped (one informant was reinterviewed), transcribed in their entirety, and analyzed using the constant comparative method and content analysis. The data which emerged supported the existence of unreported CP and represented a process of decision-making under conditions of uncertainty, in response to the symptoms associated with an AMI. This decision-making process occurred prior to hospitalization, and again when the symptoms recurred during hospitalization. Slight differences were noted in the themes elicited during the two phases. Inherent in this process were themes which supported key concepts in the Health Belief Model. Both the pre-hospitalization and hospitalization phases of the decision-making process involved three stages. (a) The Experience of Pain, (b) Assessing the Pain, and (c) Taking Action. The reporting of pain (or failure to report pain) was found to be influenced by a broad range of

internal and external cues which occurred throughout the decison-making process. Implications for HCPs and future research are discussed.

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CHAPTER I: INTRODUCTION

Cardiovascular disease was responsible for 513,000 deaths in the United States in 1987, and is the number one killer of adults in the United States (American Heart Association, 1990). One and one half million Americans are predicted to experience an acute myocardial infarction (AMI) in 1990 (American Heart Association, 1990). Although other signs and symptoms accompany an AMI, such as nausea, vomiting, diaphoresis, pain is the symptom which results in the patient's decision to seek medical help (Hofgren et al., 1988; Puntillo, 1990; Riegel, 1985).

Acute pain is very psychologically and physiologically demanding, with the fear of pain ranked second only to death (Zborowski, 1969). Fear and anxiety are magnified in the setting of an AMI due to the sudden and unexpected nature of the pain, and recognition that death or disability may result (Altice & Jamison, 1989). The presence of chest pain (CP) indicates ischemia and an evolving MI rather than the presence of necrotic tissue, and the presumed cessation of injury. In addition, the occurrence of pain may cause damage to the infarcting myocardium because of the pain itself, as pain causes a release of catecholamines which further constrict the coronary arteries, increase oxygen demand, and may accentuate arrhythmias (Altice & Jamison, 1989; Misinski, 1987; Riegel, 1985). The relief of pain is therefore of prime concern in limiting the destructive effects of myocardial ischemia. The nurses' awareness of patients' chest pain (CP), in the setting of an AMI, is vitally important so that prompt, aggressive pain management interventions can be instituted.

Because sensory experiences are private, no direct measure of pain is possible; therefore health care personnel are dependent upon the patient

to report the presence and extent of pain (Peck, 1986). If the symptoms of myocardial ischemia are not verbally communicated to the hospital staff, the patient's ischemia may go untreated. A review of the literature suggest the presence of unreported CP in coronary patients, however, this phenomenon is not fully explained. Schneider's 1987 study, demonstrated that 73.6% of the AMI patients he interviewed stated that they experienced one or more episodes of CP that they did not report to the coronary care unit (CCU) staff at the time of occurrence. This exploratory study was the only research found which investigated the phenomenon of unreported CP.

The experience of pain is a highly complex human experience with a multiplicity of contributing factors (Peck, 1986). While numerous research studies have been conducted in a number of areas relating to myocardial infarctions, few, if any, have studied the experience of pain from the patient's perspective. Pain is a unique, complex, and universal experience (Alspach & Williams, 1985). Further insight into the subjective experience of pain, and the factors that influence the reporting, or lack of reporting pain, may enhance health care professionals' ability to assess and intervene in the management of AMI pain.

Purpose of the Study

The purpose of this study is to identify and describe the processes which contribute to the reporting of pain in patients following an AMI. Specifically, the proposed research will be an inductive study and focus on the following research questions: (1) Do patients diagnosed with an AMI report all instances of perceived pain? (2) What factors influence patients

diagnosed with an AMI to report, or not to report, the pain? and (3) What is the process that culminates in an AMI patient's decision to report, or not report, pain?

Theoretical Perspective

The theoretical perspective for this study was drawn from social-psychological theories of decision-making under conditions of uncertainty. Mishel (1988) defined uncertainty as the "...cognitive state created when the person cannot adequately structure or categorize an event because of the lack of sufficient cues" (p. 225). The symptoms of an AMI may not be recognized as such, and therefore, uncertainty as to the etiology of the symptoms, and how and when to act may exist.

The major theoretical constructs are derived from Rotter's (1964) social learning theory and Rosenstock's Health Belief Model (HBM) (1974a), and serve as a framework for understanding health behavior actions, or lack of actions, that individuals undertake in order to prevent illness, define symptoms or seek help. Social learning theory and the HBM both have their origins in Lewin's (1935) field theory, specifically in the level-of-aspiration situation (Maiman & Becker, 1974; Rosenstock, 1974a; Rosenstock, Strecher, & Becker, 1988). Lewin (1975) defined level-of-aspiration as the degree of difficulty of attaining the goal toward which one is striving. Lewin postulated that behavior depended upon two variables: (a) the valence, or value, of an outcome to an individual, and (b) the individual's estimate of the probability that a specified action will result in that outcome. Lewin predicted that individuals would not choose

highly improbable success over reasonably probable success, even though the goal of the former was more highly valued (Mikhail, 1981).

Rotter's social learning theory emphasized the "... continuous reciprocal interaction between cognitive, behavioral, and environmental determinants" (Bandura, 1977, p. vii). Rotter (1964) suggested that people did not just react to environmental stimuli- they selected, organized, and interpreted the stimuli. Behavior was determined by the importance of goals or reinforcements, and the person's expectancy that these goals will occur, based upon previous experience (Rotter, 1964). Rotter's main constructs of expectancy, reinforcement value, and behavior potential, parallel Lewin's constructs of subjective probability, valence, and behavioral outcome, respectively. Rotter (1964) defined expectancy as the subjectively held probability that a reinforcer will occur as a result of a specific behavior. Reinforcement value was the degree of preference for a particular reinforcement, given that the probability of occurrence was equal, and behavior potential was the probability of a behavior occurring in a given situation, in relation to the reinforcement (Rotter, 1964).

The Health Belief Model, developed by Hochbaum, Leventhal, Kegeles, and Rosenstock, in the early 1950s (Mikhail, 1981), built upon Lewin's theory and is also characterized as a value-expectancy model (Kirscht, 1974; Maiman & Becker, 1974). The HBM assumes that actions are contingent upon motivation, and that motives determine the way in which an individual perceives his environment (Maiman & Becker, 1974). The subjective perceptions of the individual are emphasized because people

act upon what they believe to exist (Mikhail, 1981). The HBM proposes the following conceptual components: (a) the individual's psychological readiness to take action, determined by his perceived susceptibility to the condition and perceived severity of the consequences of contracting the condition (or resusceptibility if the illness has already been diagnosed); (b) the benefits and barriers that the individual perceives regarding the action; and (c) an internal or external stimulus, known as the "cue to action", which triggers the behavior. Rosenstock (1974a) believed that individuals must be consciously aware of their feelings for action to occur. Although the HBM was developed to explain preventive health behavior, several studies have shown the model to be of value with persons already diagnosed as being ill (Becker & Maiman, 1975).

Symptoms, such as pain, may represent a threat to the individual or act as the cue to action. Symptoms vary in their clarity as cues, however, and may be influenced by the context in which they occur. Recognition of symptoms is highly influenced by learning, and is thought to be culturally related (Kirscht, 1974). Illness behavior, defined by Mechanic (1962, p. 189) as the "ways in which symptoms may be differentially perceived, evaluated, and acted (or not acted) upon by different kinds of persons", involves many variables inherent in the HBM. These variables affect individual health behavior. Although pain is the symptom that most commonly brings patients with an AMI into the hospital (Riegel, 1985), individuals who do not perceive themselves to be susceptible to an AMI may fail to recognize the symptoms as being related to their heart, and thus, may not perceive the pain to be of sufficient severity to seek

medical help. This view is supported by Hackett and Cassem's (1969) classic findings that time of delay, from the onset of symptoms to the arrival at the hospital, decreased as the perceived severity of the symptoms increased. The authors also found that patients who attributed their symptoms to organs other than their heart had the longest delay. Social and cultural factors are likely to also be involved in the decision to seek help (Hofgren et al., 1988), as are the individual's coping mechanisms, particularly the use of denial (Hackett & Cassem, 1969).

Patients vary in their interpretations of the significance of CP and in their responses to the presence of such pain (Hackett & Cassem, 1969; Hofgren et al., 1988). Because hospitalized patients are dependent upon nurses for pain-relieving interventions, communication of the presence of pain is the key to obtaining pain relief. Although pain intensity has been demonstrated to influence an individual's decision to report the presence of pain or to seek medical help (Bondestam et al., 1987; Hofgren et al., 1988), the severity of pain is not the only factor which influences its verbal expression. Despite severe CP (i.e., a score of 7-8 out of a maximum of 10), 20% of the subjects in Bondestam et al's. 1987 study did not verbally report the presence of pain, and thus did not receive pain-relieving interventions. These variables, which stem from decision-making under conditions of uncertainty, may explain AMI patients' responses to symptoms, in terms of reporting (or failure to report) episodes of ischemic pain.

CHAPTER II: LITERATURE REVIEW

The following literature review will explore research supportive of the constructs and variables contributing to the nature, perception, and communication of pain. The review will be organized according to the following major categories: the concept of pain, the physiological mechanisms of pain, variables affecting the perception of pain, variables affecting the communication of pain, and the psychological responses to an AMI. These conceptual areas were reviewed to support those tentative factors which may contribute to individual decision-making regarding the reporting of pain.

Concept of Pain

A comprehensive pain theory has yet to be developed, however, experts agree that pain is a multidimensional, highly complex, and individualized experience, which integrates neurophysiological, psychological, sociocultural, and behavioral influences (Bray, 1986; Chapman, 1986; McFarland & McFarlane, 1989; Melzack & Wall, 1988; Peck, 1986; Wells, 1984). Pain varies greatly between individuals, and even within the same individual at different times or under different circumstances (Wells, 1984). Due to its complexity, pain has been difficult to comprehensively define. Melzack and Wall (1982) viewed pain as a category of experiences which signify a multitude of different, unique experiences, having a variety of causes, and further characterized by different qualities which vary in their sensory and affective dimensions. The International Association for the Study of Pain defined pain as "...an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (cited in

McGuire, 1985, p. 83). McCaffery (1979) emphasized the subjective and personal nature of pain, and defined pain simply as "...whatever the experiencing person says it is, existing whenever he says it does" (p. 11).

Formerly, pain was thought to be linearly related to the extent of injury, with increased pain associated with greater tissue damage. However, Beecher's (1956) study of 215 soldiers who were severely wounded in battle showed that this was not the case. Only twenty seven percent of the soldiers examined stated that they had enough pain to request medication. This small percentage was not attributable to a shock state, as the soldiers vigorously protested inept venipuncture attempts. In contrast, 83% of the control group, civilian patients who had incisions similar to the battlefield wounds, wanted morphine for their pain (Beecher, 1956). Beecher (1956) interpreted these findings to indicate that the context in which the pain occurs can significantly influence the meaning that the individual attributes to it.

Numerous clinical and experimental studies have been conducted to learn more about pain, and the factors that influence its perception (Beecher, 1956; Chen, Dworkin, Haug, & Gehrig, 1989; Craig & Weiss, 1971; Flannery, Sos, & McGovern, 1981; Lander, Fowler-Kerry, & Hargreaves, 1989; Lipton & Marbach, 1984; Volicer, 1978; Voshall, 1980; Weisenberg, Kreindler, Schachat, & Werboff, 1975; Zborowski, 1952; Zola, 1966). Present evidence suggests that the majority of people have a uniform sensation threshold, which Melzack and Wall (1988) defined as the lowest stimulus level at which a sensation is first reported. What does differ, however, is the level at which people perceive a stimulus to be painful

(pain threshold), and the amount of pain they are willing to endure (pain tolerance) (Melzack & Wall, 1988). To elucidate this complex phenomenon, the physiological, biological, psychological, and sociocultural factors which may influence the experience of pain are discussed below.

Physiological Mechanisms of Pain

The physiological mechanisms involved in the perception of pain involve a complex interaction between the activation of nociceptors, transmission of the noxious stimuli through specific sensory nerve fibers, and integration at the level of the spinal cord and brain (Dubner & Bennett, 1983). Nociceptors are free nerve endings found in skin, blood vessels, subcutaneous tissue, muscle, fascia, periosteum, viscera, joints, and other structures, which transmit neural impulses after activation from noxious stimuli (Chapman, 1984). Nociceptors are located at the endings of small afferent fibers and are characterized by: (a) small receptive fields, (b) high response thresholds, and (c) relatively persistent discharges to a suprathreshold stimulus without rapid adaptation (Chapman, 1984). Nociceptors vary, with small, unmyelinated fibers transmitting impulses slowly, and large, myelinated fibers conducting impulses more rapidly.

Afferent fibers are divided into three major groups, termed A, B, and C. Class A fibers are myelinated and have a larger diameter than B and C fibers. Class A fibers are further categorized into alpha, beta, gamma, and delta subgroups. Approximately 10-25% of A-delta fibers only transmit noxious impulses from very strong stimuli (Chapman, 1984). Other types of A fibers do not appear to carry nociceptive impulses, nor do class B

fibers, which are myelinated preganglionic fibers of the autonomic nervous system (Chapman, 1984). Class C fibers are myelinated and conduct slowly, responding to mechanical, thermal, and chemical stimuli (i.e., polymodal) (Dubner & Bennett, 1983; Greer & Hoyt, 1990). Class A-delta fibers rapidly transmit well-localized, sharp pain experiences which are immediately associated with the injury, and are not persistent in nature. Class C fibers give rise to dull, poorly localized pain which is slow to occur, and is persistent (Greer & Hoyt, 1990).

Nociceptive fibers have cell bodies in the spinal ganglia, which enter the dorsal horn posteriorly, and terminate in synapses with the cells of the laminae I, II, III, and V in the dorsal horn of the spinal cord. Impulses leaving the dorsal horn ascend via the spinothalamic pathway, and stimulate somatic motor neurons on the anterior horn, or preganglionic neurons of the autonomic nervous system in the anterolateral horn (Chapman, 1984). Class C pain fibers transmit information to the reticular formation of the brain stem and essentially terminate in the thalamus. Class A-delta fibers transmit signals more directly to the thalamus and sensory cortex, enabling the fine localization of the noxious stimulus (Kapit, Macey, & Meisami, 1987). The cortex is hypothesized to function in the interpretation of the quality of pain (Greer & Hoyt, 1990).

Counterirritation techniques for the relief of pain have been known for centuries (Talbot, Duncan, & Bushnell, 1989). Recently, Talbot et al. described a possible mechanism by which this occurs. These researchers demonstrated that when subjects placed their hands in cold water, their

ability to discriminate small changes in temperature applied to another part of their body decreased. The impairment of nociception was found to last (although to a lesser degree), after the subjects' hands were removed from the cold water, and these results were not found to be the result of distraction, fatigue, or changes in response bias (Talbot et al., 1989). Previous studies have shown that " similar heterotopically applied noxious stimuli selectively and completely inhibit the activity of wide-dynamic-range (WDR) neurons in the dorsal horn- a phenomenon termed diffuse noxious inhibitory controls (DNICs)" (Talbot et al., 1989, p. 231). WDR neurons respond to both innocuous and injurious stimuli, differentiating between the two by discharging at a higher frequency to injurious stimuli (Dubner & Bennett, 1983). Thus, WDR neurons may be needed for the normal sensory-discriminative aspects of pain perception (Dubner & Bennett, 1983; Talbot et al., 1989).

Pain Producing Substances

Nociception can be provoked by mechanical, thermal, and chemical stimuli. Chemical stimuli, known as algogenic substances, occur naturally in the tissue environment of nociceptors. Some of these substances produce pain when they are applied to free nerve endings (i.e., acetylcholine, serotonin, histamine, and bradykinin, acids, potassium ions) (Fields, 1987). Other substances do not cause pain, but sensitize the nerve endings, for example, prostaglandins of the E group (Fields, 1987). Algogenic substances are known to accompany the inflammatory process, and are believed to be responsible for producing the inflammation. In

addition, inflammation alters the microcirculation, and thereby contributes to nociception (Chapman, 1984).

Neurotransmitters

Several of the central nervous system neuroregulators have been found to play a role in the experience of pain, in that the majority of them are algogenic substances. These neurotransmitters can be modified by medications which block the transmission of nociceptive impulses via the pain pathways. They include: (a) acetylcholine, (b) bradykinin, (c) dopamine, (d) epinephrine, (e) norepinephrine, (f) serotonin, (g) beta-endorphins (which will be addressed more fully below), (h) histamine, (i) neurotensin, (j) prostaglandins, (k) substance P, (l) thyrotropin releasing hormone, and (m) vasopressin (Bray, 1986). Somastatin is thought to play an inhibitory role in nociceptive transmission (Chapman, 1984).

In summary, the physiological mechanisms involved in the perception of pain include: (a) the activation of the nociceptors by mechanical, thermal, or algogenic stimuli; (b) transmission of the stimulus through class A-delta or class C afferent sensory nerve fibers, and (c) integration of the stimuli at the level of the spinal cord and brain. The importance of neurotransmitters in the perception of pain, particularly beta-endorphins, has been the subject of increasing research, and is explicated below.

Endogenous Pain Control System

The endogenous pain control system is now recognized to play an important role in the modulation of pain (Akil et al., 1984; Fields, 1988; Sheps et al., 1987; Sheps et al., 1988). This system consists of three major components: (a) the midbrain periaqueductal gray, (b) rostral

ventromedial medulla, and (c) the superficial layers of the dorsal horn of the spinal cord (Fields & Basbaum, 1989). Research has shown that electrical stimulation of the periaqueductal gray or raphe magnus nucleus can almost completely block strong pain stimuli (Dubner & Bennett, 1983; Fields, 1988). This is thought to occur because descending control fibers projecting from the dorsal horn of the spinal cord can suppress the transmission of pain signals (Kapit et al., 1987).

Naturally occurring opioid substances, named endorphins, were identified in the mid 1970s. It is currently believed that part of the variability in acute clinical pain is due to the modulation of the endogenous pain control system (Fields, 1988; Sheps et al., 1987; Sheps et al., 1988). When inhibitory interneurons in the dorsal horn are stimulated, enkephalin (a type of endorphin) is released. Descending fibers are thought to activate inhibitory interneurons in the dorsal horn, causing the release of enkephalin. Enkephalin binds with opiate receptors in the synapses of cells in the dorsal horn and suppresses the nociceptive signal, by decreasing the amount of substance P or by postsynaptic inhibition of the relay cells (Kapit et al., 1987).

Beta-endorphin is the most potent of the endogenous opioids that have been discovered to date (Fields, 1988; Sheps et al., 1988). Endogenous opioids are similar to morphine and their action can be reversed by naloxone (Fields, 1988; Sheps et al., 1988). Research has suggested that endorphin levels are decreased with prolonged pain, recurrent stress, and the prolonged use of alcohol or morphine; and increased as a result of brief stress and pain, physical exertion, massive trauma, some types of

acupuncture and transcutaneous electric nerve stimulation, sexual activity, and possibly placebos. (Cahill, 1989; Liebeskind & Paul, 1977; McCaffery & Beebe, 1989; Paulev et al., 1989; Sheps et al., 1988; Varrassi, Bazzano, & Edwards, 1989).

Enkephalins appear to serve as neurotransmitters, and to inhibit the release of substance P (SP) (Chapman, 1984). SP is thought to be the neurotransmitter of the primary afferent nociceptors (Greer & Hoyt, 1990). Enkephalins have a short duration of action and act to inhibit nociception in the substantia gelatinosa of the dorsal horn (Chapman, 1984).

Dynorphin, another opiate-like peptide which is less well understood, may also play a role in pain modulation (Sheps et al., 1988). Tulunay, Jen, Chang, Loh, and Lee (1981) demonstrated that dynorphin can modify morphine- or beta-endorphin-induced analgesia in mice. However, the results were variable. In naive animals, dynorphin caused inhibition of analgesia, while in morphine-tolerant animals, it caused potentiation. The research of Tiseo, Adler, and Liu-Chen (1990) added to our understanding of dynorphin. The authors found that exposure to noxious cold resulted in a significant increase in SP in the spinal cord, but did not alter the level of somatostatin (SST). Conversely, noxious heat enhanced the release of SST, but not SP. Dynorphin was found to reduce the cold-evoked release of SP. Tiseo et al. (1990) suggest that the difference in neurotransmitter release may explain why dynorphin can be a potent analgesic in some types of pain, and be ineffective in other types of pain.

Endorphins have been found to play an important role in the perception of pain, including that resulting from coronary ischemia. Sheps et al. (1987) and Sheps et al. (1988) studied the beta-endorphin levels, before and after exercise, in patients with angina or silent ischemia, in two separate experiments. In both experiments, all patients showed evidence of ischemia after exercise, however, the patients who had angina had beta-endorphin levels that were significantly lower than the patients with silent ischemia. Additionally, post-exercise beta-endorphin levels were positively correlated with the amount of time to the onset of angina, and negatively correlated with the occurrence of angina and its duration (Sheps et al., 1987; Sheps et al., 1988). Sheps et al. (1988) noted that beta-endorphin levels peak during the morning, which is the same time that ischemic activity is the most prevalent. The researchers concluded that patients with silent ischemia may have defective pain perception systems (Sheps et al., 1987; Sheps et al., 1988).

Cahill (1989) examined the effects of beta-endorphin during pregnancy and labor, by comparing the beta-endorphin levels of 10 pregnant women, 16 nonpregnant women, and 18 men. Although no statistical association between subjective pain levels and beta-endorphin levels was found, Cahill noted a significant pattern in the laboring women's pain response. As labor progressed, women perceived a greater increase in pain between contractions than during contractions. Cahill (1989) conceptualized the labor process as consisting of "periods of acute pain alternating with periods of discomfort" (p. 202), and suggested that beta-endorphins increase the women's ability to tolerate acute pain.

Varrassi et al. (1989) found that women who underwent aerobic training during pregnancy had higher beta-endorphin levels and perceived less pain during labor than pregnant control subjects who did not exercise. The authors noted that endogenous opiates are thought to be capable of increasing lipolysis, and that aerobic training favors the catabolism of fat rather than glycogen. This mechanism may affect pain perception by helping to reduce the amount of lactic acid which accumulates in the tissues during labor (Varrassi et al., 1989).

Similarly, Paulev et al. (1989) conducted a double-blind cross-over study of the effects of endorphins on the perception of pain during endurance exercise. The authors noted that although subjects in both the group that received naloxone, and the control group gave almost identical responses to a modified McGill Pain Questionnaire, the "claim of pain" occurred in 12 out of 17 subjects in the experimental group, as opposed to only 3 out 17 subjects in the control group ($2p<.05$) (Paulev et al., 1989).

Recently, several animal studies and a few human studies have demonstrated an association between increased blood pressure (BP) and hypalgesia (a diminished perception of pain) (Ghione, Rosa, Mezzasalma, & Panattoni, 1988; Sheps et al., 1989). Ghione et al. (1988) compared the perception of experimental dental pain between 80 normotensive subjects and 76 subjects with borderline or established hypertension on a blind basis for two and one-half years. The authors found a significant correlation between mean arterial pressure and sensory threshold ($p<.0001$), and between mean arterial pressure and pain threshold ($p<.001$). Twenty-five hypertensive subjects who were being treated with

medication or sodium restriction were retested three months later. Although most of these subjects had a significant decrease in their BP, no significant changes were noted in their sensory and pain thresholds. Ghione et al. (1988) noted that areas of the brain stem which regulate BP and "those involved in the modulation of pain transmission are closely associated or may even partially overlap" (p. 495). Similarly, Sheps et al. (1989) demonstrated a link between the cardiovascular baroreceptor arc and the modulation of pain. The authors noted that the higher the subject's systolic BP, the greater the time interval between electrocardiographic evidence of ischemia and the perception of CP ($p=.03$), as well as the shorter the duration of pain ($p<.01$) (Sheps et al., 1989).

It is clear that while our knowledge of the intricate physiological mechanisms involved in the perception of pain is rapidly expanding, much remains to be discovered. One aspect that appears certain is that at least part of the variability in acute clinical pain results from the action of the endogenous pain control system (Fields, 1988; Sheps et al., 1987; Sheps et al., 1988). Beta-endorphins, specifically, have been demonstrated to have a clear role in the modulation of pain.

Variables Affecting the Perception of Pain

Pain is associated with biological, psychological and sociocultural factors which also contribute to illness. The interpretation of the pain sensation, the response to the sensation, the tendency to report the pain to another person, and the person's response to treatment are factors resulting from the complexity of the human organism (Jacox, 1977).

Variables such as age, gender, anxiety and attention to pain, socioeconomic factors, ethnicity and cultural differences, perceived control, social modeling, personality attributes, and the nurse-patient interaction have all been shown to affect an individual's response to pain (Lander et al., 1989; Lipton & Marbach, 1984; Litt, 1988; Malow, West, & Sutker, 1989; Moss & Meyer, 1966; Prkachin, Currie, & Craig, 1983; Wise, Hall, & Wong, 1978; Zborowski, 1952). A discussion of the effects of these factors which contribute to the experience of pain is presented below. Age, gender, anxiety and attention to pain, socioeconomic factors, ethnicity and cultural differences, perceived control, social modeling, personality attributes, and the nurse-patient interaction may be extrapolated to the reporting of pain in the acute illness situation.

It is important to note that significant methodological differences exist between these studies, making comparisons more difficult. While some studies measured pain threshold, other studies measured pain tolerance, and the methods of measurement, as well as the nature of the noxious stimulus varied widely. These factors may help account for the diverse findings. Generalization from experimentally induced pain to clinical pain must be approached with caution (Beecher, 1956; Jacox, 1977); however, the findings are strengthened when the results of both types of studies converge (Peck, 1986).

The results of Williams and Thorn's (1989) study of pain beliefs is also germane to the issue of clinical versus experimental studies. These authors examined 87 patients with chronic pain and demonstrated that the belief that pain will be enduring was more strongly related to

subjective pain intensity than the actual duration of the pain. This finding has relevance to the differences between experimentally induced pain, which is known to be of short duration, and clinical pain, in which the duration of pain is frequently unknown.

Gender and Age

Studies examining the relationship of gender and age to the perception of pain have demonstrated conflicting results. Experimental studies of pain have generally reported that women have a lower pain threshold, pain tolerance, and report a greater intensity of pain, in comparison to men. However, gender differences in perceived pain in the clinical setting have not been established (Lander et al., 1989).

Mechanic (1976) reviewed the role of gender in illness behavior and the use of health services and found several conceptual and methodological problems in many of the studies. Mechanic (1976) noted that it was not clear whether women perceived, or reported, more symptoms because they had more health knowledge, or if women were more willing than men to express distress because it is more socially acceptable in our culture. Mechanic (1976) found no gender differences in the willingness to report symptoms of illness in fourth graders, but by the eighth grade only 59% of boys were willing to relate their feelings, in comparison with 75% of the girls. In addition, Mechanic (1976) suggested that men and women express distress differently, and distress behaviors which are more commonly found in men (e.g., alcohol and drug abuse, violence, and aggressiveness), were frequently not studied (Mechanic, 1976).

Robin, Vinard, Vernet-Maury, and Saumet (1987) studied the effects of gender and anxiety on experimental pain. The authors found that males had a slightly higher pain threshold than females, although the results were statistically non-significant. However, males were found to have a significantly greater pain tolerance level than females regardless of the degree of anxiety ($p<.02$) (Robin et al., 1987).

Lander et al. (1989) studied three diverse groups with clinical pain: (a) 200 children between the ages of 4 1/2 and 6 1/2 who received injections, (b) 75 adults post abdominal surgery, and (c) 78 patients who had knee pain due to arthritis or arthralgia. No significant differences in pain intensity ratings were found between the sexes in any of the groups, although the authors suggested that gender differences may be related to pain behaviors rather than pain sensitivity (Lander et al., 1989).

Schludermann and Zubek (1962) examined the effect of age on the pain threshold of 171 men ranging in age from 12 to 83. The results of this study demonstrated that the pain threshold remained relatively constant with age until the late fifties, and then noticeably declined. However, the validity of the results are questionable, since socioeconomic variables were not controlled, and may have affected the findings (Lipton & Marbach, 1984).

Woodrow, Friedman, Siegelaub, and Collen (1972) administered a pain tolerance test to 41,119 subjects as part of a physical examination screening. The investigators found that pain tolerance decreased with age in both sexes, although less marked in women. Men tolerated more pain than women, regardless of age. Differences in the pain tolerance levels of

Blacks, Whites, and Asian-Americans were reported, however, racial differences were less marked than differences related to age and gender. The authors noted that the literature reflected an increase in pain tolerance when radiant heat was the noxious stimulus, and concluded that tolerance to cutaneous pain increased and tolerance to deep pain decreased with increasing age (Woodrow et al., 1972).

In contrast, Chen, Dworkin, Haug, and Gehrig (1989), in their examination of pain endurance, did not find age to be a factor in the perceived severity of tonic pain in experimental subjects. Similarly, Ghione et al. (1988) found no significant effect of age or gender on experimentally induced pain.

Anxiety and Attention to Pain

The relationship between pain and anxiety has been well established in a wide range of clinical and experimental experiences with pain (Peck, 1986). Many researchers (Malow et al., 1989; Peck, 1986; Robin et al., 1987) currently feel that there is a linear relationship between pain and anxiety, with increased anxiety related to increased pain (Peck, 1986). This relationship has not been uniformly supported, however (Peck, 1986). Anxiety can also cause secondary pain, such as a headache.

Chen et al. (1989) completed six studies on 205 young men to examine the psychological determinants of pain responsivity, using the cold-pressor test, which is similar to many types of naturally occurring pain. The investigators found that subjects fell into two dichotomous categories: those who were pain- sensitive (PS), and those who were pain-tolerant (PT). Both PS and PT individuals perceived similar levels of pain

aversiveness, but the PT subjects endured the noxious stimulus five times longer than the PS subjects, and still rated the pain as less intense. The authors reported that pain perception was significantly associated with state anxietv in PS subjects ($p<.05$), but not in PT subjects. Chen et al. (1989) postulated that the "central hypothesis of affective and cognitive integration during pain perception may clearly discriminate PS from PT subjects" (p. 155).

In 1989, Malow et al. examined the effects of anxiety and pain perception in 30 veterans who underwent inpatient chemical detoxification. The authors found that drug abusers who had a significant decrease in their self-reported anxiety level following detoxification showed decreased pain intensity ratings and enhanced discriminability. Additionally, these subjects demonstrated a lessened tendency to report pain at post-test, as compared with their baseline performance. Subjects whose anxiety level remained high following treatment, showed none of the same effects.

Anxiety played a variable role in a study conducted by Choinère, Melzack, Rondeau, Girard, and Paquin (1989). These authors found that burn patients with high levels of anxiety had higher pain scores while at rest, although anxiety was not associated with the perceived severity of pain during therapeutic procedures.

Bruegel (1971) found no significant relationship between anxiety and postoperative pain perception, however, the instrument she used may not have been appropriate to this type of study. Bruegel reported that the Institute for Personality and Ability Testing Anxiety Scale Questionnaire

measured trait anxiety, which was a relatively enduring aspect of personality, as opposed to state anxiety, which was more situationally determined. Measures of state anxiety, or physiological measures such as plasma steroid levels, would perhaps have been more appropriate as a measure of anxiety related to surgical procedures (Bruegel, 1971).

The attention to the stimulus has been shown to increase the perception of pain, while attentional manipulation and cognitive strategies (i.e., relaxation, imagery, distraction, psychoprophylactic childbirth techniques) have been demonstrated to be powerful methods to decrease the perception of pain (Cogan & Kluthe, 1981; Fernandez & Turk, 1989; Hodes, Howland, Lightfoot, & Cleeland, 1990; Litt, 1988; Miltner, Johnson, Braun, & Larbig, 1989; Mulcahy & Janz, 1973; Peck, 1986). However, the exact mechanism by which this is accomplished is not yet known (Cogan & Kluthe, 1981; Litt, 1988).

Hall & Stride (1954) found that when the word "pain" was included in instructions accompanying an experimental treatment, subjects perceived an electrical shock as painful, whereas the same electrical shock was not perceived as painful when the word "pain" was absent from the instructions. The authors concluded that the anticipation of pain was sufficient to raise the level of anxiety and intensity of perceived pain. Conversely, Blitz and Dinnerstein (1971) found significant elevations in the pain threshold of two experimental groups who were instructed to focus on the cold water stimulus as a pleasant sensation, or focus on the cold and dissociate the feeling of pain ($p<0.02$), with men showing a greater elevation in threshold than women ($p<0.05$).

Relaxation techniques have been demonstrated to increase subjects' pain threshold or pain tolerance levels. Mulcahy and Janz (1973) and Cogan and Kluthe (1981) reported that specifically the Wright psychoprophylactic childbirth technique, and relaxation techniques in general, reduced the perception of pain in experimental studies. Miltner et al. (1989) noted that subjects whose attention was refocused on solving a difficult word puzzle perceived less pain intensity than subjects who were required to count each electrical stimulus. These findings are supported by Fernandez and Turk's (1989) meta-analysis of 51 research studies, which found that over 85% of the time, cognitive coping strategies had a positive effect in enhancing the pain threshold or pain tolerance of subjects, as compared to controls who received no treatment.

Preoperative teaching, which included methods to decrease tension on the abdominal muscles and control "gas pain", was found to decrease the amount of analgesics that cholecystectomy patients required on the third through fifth postoperative days, although this effect was not noted during the first 48 hours (Voshall, 1980). In contrast, Mogan, Wells, and Robertson (1985) found that relaxation techniques taught preoperatively did not reduce the postoperative intensity of pain, nor the consumption of analgesics.

It is apparent that anxiety and attention to the noxious stimulus play an important role in enhancing the perception of pain. Because anxiety is known to accompany hospitalization with the diagnosis of an AMI (Byrne, 1987; Thomas et al., 1983), it is an important variable to consider when studying patients with pain.

Socioeconomic Factors

Socioeconomic factors are suggested to play a role in the response to pain, although the results have been varied. While some researchers have demonstrated that persons in lower socioeconomic classes are less likely to report symptoms, or seek medical help in response to these symptoms (Koos, 1954; Richardson, 1970), other investigators have reported contrary findings (Andersen, Anderson, & Smedby, 1968; Bice and White, 1969).

In his classic study, Koos (1954) found that many persons in lower socioeconomic classes viewed pain and other symptoms of illness as part of their everyday existence and regarded it as something to be tolerated. Andersen et al's. (1968) study of the patterns of physician and hospital utilization in the United States and Sweden demonstrated that socioeconomic variables played a greater role in the response to symptoms than the reporting of symptoms. When symptoms were present, consulting a physician depended more upon class and income than did sex and age. In general, persons with a higher income, educational level, and occupational rank tended to report fewer symptoms. However, in Sweden, little relationship was reported between consulting a doctor and income. This finding may have been related to the practice of socialized medicine. Conversely, subjects in the United States showed the opposite trend with regard to symptoms, with individuals in a higher socioeconomic status (SES) consulting a doctor more often than those in a lower SES.

Bice and White (1969) also found that SES affected physician utilization in response to symptoms. In England and Vermont individuals in the

middle socioeconomic group were more likely to see a physician than those in the highest and lowest categories. Both Andersen et al. (1968) and Bice and White (1969) found that agricultural workers were significantly less likely to consult a physician than non-agricultural workers.

The hypothesis that SES influences illness behavior was supported by Richardson's (1970) study of the use of physicians' services among the urban poor living in three United States cities. Richardson found that symptoms which caused persons with a low income to lose two days of work were more serious than symptoms causing persons with a higher income to miss two days of work.

Lipton and Marbach (1984) demonstrated that social class was one of the most important predictors of intraethnic variation. Ethnic members with a high SES tended to differ in health practices, as compared with members of a lower SES. These authors speculated that "health behavior of members of higher socioeconomic classes tend to be more similar across ethnic groups than behaviors of lower class members" (Lipton & Marbach, 1984, p. 1280). In contrast, variations in pain severity were not found to be related to socio-demographic variables by Choinière et al. (1989).

Marital status has also been found to be a factor in symptom reporting (Andersen et al., 1968) and pain ratings (Bruegel, 1971). Andersen et al. (1968) noted that the proportion of people reporting symptoms in Sweden and the United States was lowest for single persons, intermediate for married individuals, and highest for those who were widowed, divorced,

or separated. Bruegel (1971) found that married persons who had undergone surgery had lower pain ratings than unmarried persons.

Ethnicity and Cultural Factors

Cultural attitudes toward pain and its meaning are illustrated in the semantics of the language (Martinelli, 1987). This is illustrated in the origins of the term for the phenomenon of pain in the variations across languages. "Punishment" is derived from the Latin word poena, which has been traced to the Sanskrit word pu, meaning purification (Martinelli, 1987). Pain was one of the first punishments for the original sins of man, and has continued to be associated with punishment throughout history. The original Latin word dolor is still used in languages of Latin derivation. "The French word peine, which conveys punishment and penalty, bears the emotional connotation of anguish and anxiety" (Martinelli, 1987, p. 273).

Ethnicity is a relevant factor in an individual's health beliefs and illness behavior (Lipton & Marbach, 1984; Martinelli, 1987; Weisenberg & Caspi, 1989; Weisenberg et al., 1975; Zborowski, 1952; Zola, 1966). Ethnicity is also a major determinant of how one communicates pain (Lipton & Marbach, 1984). Researchers have found that an individual's ethnic background influences the perception of symptoms as well as how one labels, responds to, and communicates this experience (Lipton & Marbach, 1984). Ethnicity is also an important factor in the decision to seek medical care, the selection of the health care provider, and the types of treatment received (Lipton & Marbach, 1984).

Zborowski's (1952) classic study demonstrated the strong effect that cultural components play in the pain experience. The ethno-cultural groups studied were Italians, Jews, Irish, and "Old Americans" (n=103). "Old-Americans" were characterized as White, Anglo-Saxon Protestants, who did not identify with any foreign groups. Zborowski (1952) found that although Jews and Italians tended to respond to pain by freely and dramatically expressing their emotions, their underlying attitudes toward pain were different. Jews were reluctant to take analgesics and focused mainly upon the meaning of the pain and its significance in relation to their health. Italians were apprehensive about the actual pain experience, and were happy when the pain was relieved. "Old-American" patients described their pain unemotionally and expressed reluctance to complain about it. Their concern centered around the incapacitating aspects of pain. Irish patients were proud of their ability to handle the pain, and were also concerned about the possibility of the implications of the pain for their future. In this benchmark study, Zborowski (1952) noted that the hospital staff preferred patients who expressed their pain, but did so in a matter-of-fact manner. Education of the patient was also found to be an important variable in patients' attitudes toward the meaning of pain, although perhaps less important than one might expect (Zborowski, 1952). Zborowski (1952) posited that the more educated patient may have more anxiety due an awareness of pain as a possible symptom of a disease, but may be more reserved in expressing the pain than an unsophisticated person.

Zola (1966) provided a classical examination of the interplay of culture and symptoms. He noted that there were at least two ways that determine how a sign would be interpreted in a given culture. When a symptom was widespread in a given culture, it was perceived as a normal state, and was therefore ignored. The second process involved the degree to which a symptom "fit" with societal values, and determined the amount of attention that the symptoms received. For example, hallucinations were considered to be a sign of psychosis in Western society, but were readily accepted in some non-literate societies (Zola, 1966). The author concluded that it was not the sign of illness, or its frequency which was significant, but the social context within which it occurred, and how it was perceived and understood (Zola, 1966).

Zola (1966) compared Italian and Irish patients who were matched by physicians according to primary diagnosis, duration of illness, and seriousness. The author found that Irish patients tended to deny pain and understate their illness more often than Italian patients, supporting Zborowski's findings. Zola (1966) concluded that ethnic group membership was the variable most strongly linked to illness behavior.

Additional information regarding the role of ethnicity in the pain experience was discovered by Weisenberg et al. (1975) and Lipton and Marbach (1984). Weisenberg et al. (1975) studied 75 Black, White, and Puerto Rican adults who presented for dental treatment. They found no significant differences between the groups in the number of tooth-related symptoms, amount of pain expressed, nor the amount of pain expected. Results of the State-Trait Anxiety Inventory and Dental Anxiety Scale

indicated that Puerto Rican patients had higher levels of anxiety and tended to deny pain. Whites on the other hand, showed the least anxiety on most measures and were most willing to endure the pain. Black patients tended to fall in between, except on the Dental Anxiety Scale, in which they had the lowest score (Weisenberg et al., 1975). The generalizability of the findings were limited, however, due to significant differences in SES, religious affiliation, and education which were present between the groups.

Lipton and Marbach (1984) examined interethnic and intraethnic differences in reported pain experiences of Blacks, Irish, Italian, Jews, and Puerto Ricans (N=250) reporting facial pain. Differences between the groups in assimilation, acculturation, level of distress, socio-demographic variables, and history and treatment of symptom were statistically controlled. These five ethnic groups were found to be similar in 66% of their reported attitudinal and behavioral responses to pain, but differed in regard to the variables which influenced their responses. Interethnic variations were found to be related to the following factors: (a) degree of medical acculturation for Black patients, (b) degree of social assimilation for Irish patients, (c) degree of psychological distress for Jewish and Puerto Rican patients, and (d) duration of pain for Italian patients. The authors concluded that while homogeneity is interethnic for most aspects of the pain experience, heterogeneity is intraethnic for factors influencing the experience (Lipton & Marbach, 1984).

Contrary to the above studies, Flannery, Sos, and McGovern (1981) did not find any significant differences in response to the pain associated with

an episiotomy among Black, Italian, Jewish, Irish, and Anglo-Saxon Protestant women. Although researchers asked the patients to focus on the episiotomy pain and not sensations from cramps or hemorrhoids, the actual ability of patients to separate these sensations may have reflected a source of error. When educational levels among these ethnic groups were covaried, no significant differences were noted. The authors suggested that other studies which found ethnic differences in the expression of pain were actually reflective of inadequately controlled educational differences. Similar studies, such as Weisenberg and Caspi (1989) and Volicer (1978) supported the same hypothesis. Weisenberg et al. (1989) found that women in low education groups showed a stronger cultural influence on pain ratings and pain behavior during childbirth, while Volicer (1978) found that hospitalized medical patients with higher educational levels reported less pain.

Another explanation for the differing results reported in studies of ethnicity was suggested by Lipton and Marbach (1984). These authors posited that closed-ended questions may not have allowed patients to sufficiently elaborate upon their experience, and may have accounted for the differences in findings. Both Flannery et al. (1981) and Lipton and Marbach's studies utilized closed-ended instruments. Zborowski (1952) and Zola's (1966) studies are the two most often quoted in support of the existence of ethnic differences (Lipton & Marbach, 1984), and both used a qualitative approach with open-ended questions.

Perceived Control of Pain

The perception of control over aversive stimuli has been demonstrated to be a determinant of the cognitive appraisal of the threat (Corah & Boffa, 1970; Litt, 1988). Studies concerning experimental pain have found that subjects who perceived that their behavior could lead to the reduction or avoidance of an electric shock perceived the stimulus to be less painful (Corah & Boffa, 1970; Glass et al., 1973), and manifested less autonomic reactivity (e.g., lower skin conductance responses) (Geer, Davison, Gatchel, 1970). Pennebaker, Burnam, Schaeffer, and Harper (1977) demonstrated that lack of control was associated with an increased reporting of symptoms. Litt (1988) found that women who perceived control over the aversive stimulus and *had high* self-efficacy perceptions showed greater pain tolerance than subjects who did not perceive control, or had low *self*-efficacy perceptions. Contrary to findings of other researchers, Litt (1988) noted that subjects who perceived more control reported more pain than subjects who perceived little control over aversive stimuli.

In a clinical experiment, McGrath, Thurston, Wright, Preshaw, and Fermin (1989) did not find postoperative patient-controlled analgesia (PCA) to be superior to intramuscular meperidine given on an as needed basis. Locus of control was examined as an independent variable to amount of narcotic required. No significant differences between the groups were found in total amount of opiates received or mean scores in health locus of control. The authors did note, however, that patient questionnaires suggested a more positive response to PCA, with a larger percentage of patients stating that they would recommend PCA, as

compared to patients who received intramuscular injections (McGrath et al., 1989).

Thus, the literature supports the idea that an individual's perception of control over an aversive stimulus is an important factor in the reduction of the cognitive appraisal of the threat. Patients who perceive some control over their pain may consider it to be less threatening, and therefore, may be less likely to report it.

Social Modeling

People learn to express their feelings and emotions very early in life by modeling themselves after others who are like themselves. The family is a major source for the transmission of these cultural norms (Weisenberg, 1977; Zborowski, 1952). Responses to pain may be modeled, however, current environmental influences and previous learning may influence a patient's perception of pain (Prkachin et al., 1983). This is evidenced by the realization that pain perception can not be separated from pain behavior, and that behavior may be affected by learning (Peck, 1986).

In an experimental study of subjects' responses to electrical shock, Craig and Weiss (1971) found that subjects who observed a model tolerate pain had a three times greater pain threshold than subjects who observed a model who was intolerant to pain. Similarly, Prkachin et al. (1983) found that subjects who were exposed to an individual modeling tolerant behavior showed no greater distress when they received high intensity shocks than subjects who received low intensity shocks and did not see a model.

Personality Attributes

Aspects of personality such as neuroticism, extroversion/introversion (Bond, 1971), and field dependence/independence (Wise, Hall, & Wong, 1978) may play a role in the pain experience. Bond (1971) studied 52 women with advanced carcinoma of the cervix and found that the patients fell into three groups: (a) patients without pain who did not receive analgesics, (b) patients with pain who did not receive analgesics, and (c) patients with pain who did receive analgesics. Bond (1971) found that the presence of symptoms was related to neuroticism, while the communication of these symptoms was related to the degree of extroversion. Patients without pain were found to have low neuroticism and high extroversion scores. Patients with pain who did not complain had high neuroticism and low extroversion scores, and patients with pain who did complain had high neuroticism and extroversion scores (Bond, 1971).

Bond (1973) replicated his 1971 study with 30 men and women undergoing stereotaxic percutaneous cordotomy for chronic pain. Patients with high neuroticism scores were found to experience a greater intensity of pain, and the entire group tended to be introverted both before and after surgery, perhaps reflecting the effects of the chronicity of the pain experience. In contrast, Weisenberg and Caspi (1989) found that extroversion ratings were not significantly related to pain ratings, pain behavior, cultural group, or educational level.

Wise et al. (1978) found that pain perception is increased in individuals who are field-dependent (i.e., can not easily disembed an item

from its context or solve problems by restructuring data). The authors noted, however, that the subjects did not necessarily have an increase in the consumption of analgesics.

The exact role that various aspects of personality play in the perception and communication of pain remains unclear. Anxiety may actually be the key to the relationship among these variables (Peck, 1986). This hypothesis is supported by Wise et al's. (1978) findings that field-dependent subjects were significantly more anxious and depressed, and the knowledge that anxiety often accompanies the neurotic state (Peck, 1986).

Nurse-Patient Interaction

The interaction between the nurse and the patient is thought to affect the patient's response to pain (Diers, Schmidt, McBride, & Davis, 1972; Moss & Meyer, 1966). However, Taylor (1987) found little research regarding the effects of this phenomenon in her review of pain research conducted in nursing from 1961 to 1984. Moss and Meyer (1966) conducted a small exploratory study and found that the following three conditions were present in every instance in which pain relief occurred: (a) the nurse introduced herself and asked how the patient felt, but did not perform any activity that was not requested by the patient, (b) the nurse and the patient discussed pain and the various pain relief measures, and (c) the patient decided on the pain management intervention to be utilized (Moss & Meyer, 1966). Moss and Meyer then incorporated all three conditions into the plan of care for the experimental group (n=25), while the control group (n=25) received similar interventions but did not

decide upon the pain relief measures to be used. The authors found that none of the control subjects obtained relief, while only one patient in the experimental group failed to obtain relief. Moss and Meyer (1966) noted that the individual in the experimental group who did not obtain relief had expressed doubt about the efficacy of the pain relief method utilized. While these results are very striking, one might question if the effect was related to the nurse-patient interaction, or the sense of control that was engendered in the patient.

Diers et al. (1972) examined three different nursing approaches to pain relief. In the first group, pain was viewed as a psychosomatic phenomenon, encompassing physical, emotional, and cognitive aspects. The second group viewed pain as a physical phenomenon, in which patients could obtain relief if they were helped to analyze the etiology of the pain and methods of relief. The third group viewed pain as strictly a physical phenomenon, and helped patients to deal with only the physical aspects of the experience. Diers et al. (1972) hypothesized that patients in the first group would experience more pain relief than subjects in the other two groups. The results of the study showed that the majority of patients in all three groups experienced some degree of pain relief. The results of the study are questionable, however, in light of significant methodological problems encountered. Despite identical instructions, the nurses interpreted the definitions of the groups differently, thus affecting the interventions they utilized (Diers et al., 1972).

Communication of Pain

The communication of pain is another complex variable, which can be affected by the factors which influence the perception of pain, as well as the use of words used to describe pain, which may differ conceptually or semantically (Tamburini, Selmi, DeConno, Ventafridda, 1987). Baer, Davitz, and Lieb (1970) conducted a study to determine if health care workers perceived differences in pain and psychological distress based upon the expression of these feelings verbally or nonverbally. Nurses, social workers, and physicians (N=74) were given 16 paired vignettes and asked to infer the amount of distress the patient felt. Each patient was presented in two situations, one situation showing the patient using verbal expressions, and the other showing the patient expressing himself through nonverbal behavior. The authors found that social workers inferred the most pain and physicians inferred the least, with the exception of nonverbal pain ratings, in which nurses scored the lowest ($p<0.02$). All groups inferred more pain in vignettes that depicted the patient expressing discomfort verbally ($p<0.01$). No significant difference between the groups was noted in the amount of psychological distress inferred (Baer et al., 1970).

In contrast, studies have demonstrated that nurses believe nonverbal behavior and physiological signs to be better indicators of pain than verbal complaints (Holm, Cohen, Dudas, Medema, & Allen, 1989; von Baeyer, Johnson, & McMillan, 1984). Nonverbal expressions of pain (i.e., moaning, limping, grimacing, rubbing the affected part, taking medications, gesturing, and avoiding exertion) have been found to convey

the affective aspect of the pain experience, and influence the response of others (von Baeyer et al.,1984). Women have shown greater skill at interpreting nonverbal behavior than men (Prkachin et al., 1983; von Baeyer et al., 1984).

Von Baeyer et al. (1984) studied the effects of nonverbal expression on the pain and distress ratings 44 female undergraduate nursing students inferred from videotapes showing a male "doctor" and female "patient". The verbal behavior was held constant, while the degree of nonverbal behavior indicative of pain was varied. The authors noted that high expressiveness of pain resulted in higher ratings of pain and distress, and that highly expressive patients were more likely to receive attention (von Baeyer et al., 1984).

Prkachin et al's. (1983) study also reflected the importance of nonverbal behavior in the communication of pain. These authors demonstrated that psychology students who watched videotapes of subjects receiving varying intensities of electric shocks were generally able to determine the level of intensity utilized from the nonverbal pain behavior of the subjects. Information about the subjects in the scenarios depicted was shown to bias the ratings of pain attributed to the subject, despite a lack of change in the direct evidence of pain (Prkachin et al., 1983).

Nurses' reliance on physiological measures of patients' pain (i.e., vital signs) was demonstrated by Bondestam et al. (1987). This study examined the relationship between pain assessments by nurses caring for patients with AMI and assessments made by the patients themselves

during the first 24 hours in the CCU. Patients' and nurses' assessments of pain were found to be well correlated ($p<0.001$). However, in 23% of the situations, nurses under-estimated the patient's pain, and in 20% of the situations, over-estimation occurred. Over-estimation was noted to occur especially in instances when the patient's heart rate and blood pressure increased. Additionally, the authors noted the existence of unreported chest pain. Approximately 50% of the patients with a pain score of five to six (out of a maximum score of 10) did not receive analgesic treatment, and 20% of patients with scores of seven to eight also went untreated. Unfortunately, the reasons behind these statistics were not investigated. Bondestam et al. (1987) underscored the need for further research and improved communication between the patients and the staff.

The existence of unreported CP was supported by Schneider (1987). He examined 19 patients who were admitted with a diagnosis of an acute or suspected MI, and found that 80% of the women and 71.4% of the men stated that they had not reported all of their episodes of chest pain to the CCU staff at the time of its occurrence. When questioned about the reasons for not reporting the pain, five categories of responses were noted: (a) pain was not severe enough, (b) patient did not want to bother the staff, (c) patient wanted to see if the pain would go away on its own, (d) miscommunication, and (e) no reason stated (Schneider, 1987).

Puntillo's (1990) study of the pain experiences of intensive care unit (ICU) patients further enhanced our understanding of unreported pain. Puntillo noted that a "few" subjects believed that the machines attached to them could alert the staff to their pain. The author further noted that

"most" of the subjects did not expect, nor did they receive, total pain relief while in the ICU. Although the majority of subjects in this study were surgical patients, these findings may, in part, explain some of the instances of unreported CP (Puntillo, 1990).

Silverman (1987) interviewed 47 men and women between the ages of 30 and 60 who were initially silent about the symptoms of their illness. He found that the tendency to remain silent was reinforced by emotionally traumatic experiences regarding illness or injury which occurred at a young age. Silence was felt to act as a defense mechanism against intense fear in 60% of the patients. Generally, patients maintained their silence until the symptoms became physically intolerable, they were pressured into breaking the silence by people close to them, or feelings such as anxiety, guilt, or depression became intolerable.

The relationships between the patients' subjective assessment of pain, communication of pain, and the nursing interventions utilized to relieve pain were explored by Bond and Pilowsky (1966) in 47 patients with advanced carcinoma. During the study period, nine patients reported no pain. Of the 38 remaining patients, 13 recorded pain that they did not verbally communicate to the nursing staff and were not given pain medication. The average pain scores of males were significantly higher than those of females ($p<0.001$) but 23% of the time, males' requests for pain medication were not met. Interestingly, requests for pain medication, despite recording a score of zero, occurred on seven occasions for males and two occasions for females. Independent decisions by the staff resulted in nine women and no men receiving pain medication

without a request (Bond & Pilowsky, 1966). This may reflect that gender differences in the communication of pain are influenced by the attitudes of the nursing staff.

Dangott, Thornton, and Page (1978) studied 20 dentists and a control group of 10 nurses, physicians, and medical technologists to determine the nature of the communication style that they utilized. Each individual was asked to explain what they said to patients when they were going to perform a painful procedure, and if they communicated differently with children. The tape-recorded responses were categorized as confirming, disconfirming, or mixed messages. Confirming messages conveyed acceptance, concern, and a willingness to become involved. Disconfirming messages conveyed indifference, misperceptions, or a denial of the feelings of others. Mixed messages contained both confirming and disconfirming qualities. Denial of patients' pain was reflected in 80% of the professionals' responses, and only 10% referred to the nonverbal communication of pain. Professionals who recognized the patient's pain tended to give information in an authoritative manner without expecting a response from the patient, thus sending mixed messages (Dangott et al., 1978). Disconfirming or mixed messages may interfere with open and honest communication between the patient and the health care professional, and may inhibit the verbal communication of pain.

Volicer (1978) studied 535 hospitalized patients to determine the relationship between hospital stress, self-reports of pain and physical status. The patients were grouped into medical and surgical categories, and then further subdivided according to seriousness of illness.

Significant heterogeneity was found among the groups, with medical patients tending to be older, have more serious illness, and more previous hospitalizations. Patients scoring high in hospital stress reported more pain than patients with low scores ($p<0.05$) (Volicer, 1978).

Hospitalized patients are dependent upon nurses to relieve their pain. The communication of this pain, either through verbal or nonverbal expression, is the key to obtaining pain relieving measures. While the reporting of pain is dependent upon the perception of pain, this is obviously not the only variable which determines its verbal expression. Although some patients receive treatment for pain despite their lack of verbal complaints, it is apparent that other patients do not, and continue to suffer in silence, thus enhancing their risk of morbidity or even mortality (Misinski, 1987; Riegel, 1985). Additional research into the factors which influence the reporting of pain is warranted.

Psychological Responses to an AMI

Psychological responses to an AMI have also been studied intensively, although predominantly utilizing male subjects. While anxiety is felt to be the most predominate emotional response (Byrne, 1987; Thomas et al., 1983), denial and depression have also been documented (Froese, Hackett, Cassem & Silverberg, 1974). Cassem and Hackett's (1971) classic study of 145 CCU patients referred for psychiatric consultation described an approximate timetable for the onset of emotional reactions to an AMI. Based upon the timing of the consultation requests, the authors found that patients displayed anxiety on hospital days one and two, with denial beginning on day two. Depression tended to occur on days three through

five, and by day five or six the patient usually resumed his usual personality and emotional pattern (Cassem & Hackett, 1971).

Froese, Hackett, Cassem, and Silverberg (1974) studied 36 patients with an AMI and classified 17 of them as "deniers". While anxiety scores for both deniers and non-deniers were high for the first two days, deniers showed a more rapid decline in their levels of anxiety and depression, as evidenced by their scores on the Holland-Sgroi Anxiety-Depression Scale and the Hackett-Cassem Denial Scale (Froese, Hackett, Cassem, & Silverberg, 1974). Froese, Vasquez, Cassem and Hackett (1974) interviewed patients within the first two hours of admission and administered the same instruments. The authors found that moderate to severe anxiety and depression was present in 55% and 43% of AMI patients, respectively, and "partial" or "major" denial was evident in 55% of the patients.

Contrary to these findings, Thomas et al. (1983) found that anxiety was reflected ten times more often than denial. Interviews with 19 CCU patients were tape-recorded, and the responses to open-ended questions designed to facilitate patient communication were analyzed by a psychiatrist and compared to results from the G-G Content Analysis Scales. Correlation between the two measures was statistically significant at $p<0.001$. While 14 of the 19 patients made a total of 128 statements that were characterized as denial, there were 1280 references that were categorized as anxiety. Thomas et al. suggested that the decrease in the amount of denial noted may reflect the publics' growing familiarity with CCUs and the nature of the questions asked. The authors hypothesized

that researchers who reported finding a significant amount of denial may have been concerned about causing the patient stress, and therefore elicited more denial (Thomas et al., 1983).

Vetter, Cay, Philip, and Strange (1977) estimated anxiety among 338 patients admitted to a CCU with ischemic heart disease using a short questionnaire derived from the Neuroticism Scale Questionnaire. The results of the study showed that within one-half hour after admission to the CCU, the patients were no more anxious than patients admitted as medical emergencies to a hospital ward. Women were found to be more anxious than men ($p<0.005$), and patients with myocardial ischemia were more anxious than those with a diagnosis of infarction ($p=0.04$). No relationship was found between the time of admission after the onset of symptoms and the level of anxiety (Vetter et al., 1977).

A comparison of the coping responses used by patients with life-threatening illnesses and those with non-life-threatening (NLT) illnesses was undertaken by Feifel, Strack, and Nagy (1987). The authors utilized the Medical Coping Modes Questionnaire to study the use of confrontation, avoidance, and acceptance-resignation in 223 men. Patients with cancer or myocardial infarctions were compared with patients diagnosed with orthopedic problems, rheumatoid arthritis, or dermatologic conditions. The results of the study showed that life-threatened patients used confrontation significantly more often than NLT patients ($p<0.001$). In all groups, acceptance-resignation was the least utilized coping mechanism.

Hackett and Cassem (1969) explored factors that contributed to patients' delay in responding to the signs and symptoms of an AMI. The

subjects were randomly selected patients with a diagnosis of suspected or confirmed AMI (N=100). Results of the study included the following: (a) no significant relationship was found between sex, age, SES, history of previous myocardial infarctions, and presenting symptoms; (b) patients perceiving their symptoms as more severe tended to have shorter delay times; (c) patients who recognized their symptoms to be heart-related had shorter delay times than patients who felt that their symptoms were from other parts of their bodies; (d) patients who decided to seek help themselves arrived at the hospital sooner than patients who needed the urging of a family member or acquaintance. In contrast, Hofgren et al. (1988) found that maximal pain intensity occurred prior to admission and was not related to the length of time between the onset of symptoms and the decision to go to the hospital.

In reviewing the literature related to patients' perceptions of the coronary care unit, Rowe and Weinert (1987) found that the earlier literature portrayed the CCU as a reassuring environment, while the later literature described it as highly stressful. Rowe and Weinert (1987) then studied 78 CCU patients and found that the patients felt the CCU to be a safe and reassuring place. Men were found to experience more stress than women, and "thinking you had a heart attack" was perceived as the most stressful hospital event. Job status, religion, age, diagnosis, marital status, and gender were not found to have significant effects (Rowe & Weinert, 1987).

An individual's psychological state affects his response to the entire illness experience, from the onset of symptoms to the post-hospitalization

recovery phase. Being hospitalized with an AMI often forces the patient to confront his or her own mortality, and is obviously a very stressful life event. Stress and anxiety have been demonstrated to increase the perception and reporting of pain. Denial may contribute to a delay in seeking medical treatment after the onset of symptoms, and may affect the reporting of pain during hospitalization.

In summary, the literature exemplifies the multidimensional nature of the pain experience and its expression in a clinical setting. Due to the complexity of the human psyche and one's life experiences, it is highly unlikely that any two persons will have the identical cognitive and affective perceptions of the same sensory stimulus, nor are they likely to respond in the same manner. In addition, significant methodological differences employed in the various studies of pain, such as the control of intervening variables, contribute to the difficulty in generalizing the findings.

While the majority of variables researched have shown equivocal results, experts agree that both endogenous and exogenous factors impinge upon the pain experience. General agreement exists regarding the following: (a) the endogenous pain control system plays an important role in the modulation of pain; (b) increased anxiety is related to an increase in the perception of pain; (c) viewing an individual modeling pain tolerant behavior can increase an individual's pain tolerance level; (d) the perception of control over an aversive stimulus diminishes the cognitive appraisal of the threat; (e) ethnocultural influences affect an individual's health beliefs, illness behavior, and communication of pain; (f)

attention to an aversive stimulus increases the perception of pain, while distraction techniques decrease the perception of pain; and (g) both verbal and nonverbal communication are essential to the comprehensive assessment and treatment of pain.

Less certain, is the role that age, gender, SES, personality attributes, and the nurse-patient relationship may play in the perception and reporting of pain. While some researchers have found these variables to be significant to the experience of pain, other researchers have reported findings to the contrary. The quality of future pain research may be improved by clear definitions of what is being studied (e.g., pain intensity, threshold, or tolerance), as well as how it is being measured. The replication of sound studies, (with enhancement of the methodology, where appropriate), would be very beneficial to the advancement of the understanding of pain. The scarcity of clinical research specifically designed to elucidate the factors which influence the reporting of pain clearly indicates a need for further research to augment the current body of knowledge regarding this phenomenon.

CHAPTER III: METHODOLOGY

The methodology utilized is described in three sections. The first section addresses the inductive method and its appropriateness to the research questions studied. The second section addresses the procedures in the inductive method and the third section discusses issues related to methodological rigor.

Design

While the literature reviewed provides evidence of the multiple factors involved in the pain experience, relatively little has been evidenced describing the reporting of AMI pain from the patient's perspective. The literature reviewed demonstrates considerable interest in the phenomenon of pain dealing with variables affecting the perception of pain, among which are anxiety, socioeconomic factors, and ethnicity (Beecher, 1956; Bice & White, 1969; Blitz & Dinnerstein, 1971; Bond & Pilowsky, 1966; Craig & Weiss, 1971; Richardson, 1970; Weisenberg et al., 1975; Zborowski, 1952; Zola, 1966). Although the existing literature presents important parameters regarding the nature of pain and the psychosocial variables affecting the perception of the same, description of the reporting of the pain experience following AMI has not been investigated. The lack of a conceptual description regarding this phenomenon made the exploratory design most appropriate to answer the research questions.

Exploratory designs are appropriate when little is known about the subject, and these designs are synonymous with qualitative research (Brink & Wood, 1989). Exploratory designs utilizing qualitative methods are often utilized in an attempt to see the world from the informant's

perspective, and were therefore appropriate to the research questions employed in this study (Brink & Wood, 1989). Brink (1989) characterizes exploratory designs as flexible, insightful, and intuitive. Flexibility allows the data to control the researcher, fostering the discovery of new phenomena or enabling the researcher to gain insight into existing phenomena. Insight encourages the development of new ideas, concepts, and theories, and intuition enables one to organize perceived reality in a manner that makes sense (Brink, 1989). The inductive approach was particularly fitting to this exploration of the reporting of the pain experience from the point of view of the experiencing person (emic point of view) because phenomena "take their meaning as much from their contexts as they do from themselves" (Lincoln & Guba, 1985, p. 189).

Procedures in Inductive Methodology

The procedures that were used in this exploratory study are described in the following sections: (a) sampling, (b) human subjects protection, (c) data collection, and (d) data analysis.

Sampling

The technique known as purposeful, or theoretical, sampling was utilized to select subjects. Qualitative methodology requires that sampling decisions are not made a priori as in quantitative studies. Theoretical sampling involves selecting subjects who can illuminate the phenomena under study by critically examining the experience and communicating detailed information about it (Morse, 1989). Theoretical sampling is an ongoing process that is based upon the needs of the study at that

particular time (Brink, 1989; Chenitz & Swanson, 1986; Morse, 1989). Miles and Huberman (1984, p. 37) stated:

> One makes gradual sense of a social phenomenon, and does it in large part by contrasting, comparing, replicating, cataloguing, and classifying the object of one's study. Basically, these are all sampling activities- finding the variabilities and commonalities of a social universe- and they are conducted progressively and iteratively by the qualitative field researcher.

The adequacy of the sample was determined by the completeness and quality of the data (Morse, 1989). To ensure adequacy of the sample, the relevance, completeness, and amount of information obtained were continually evaluated throughout the data collection period (Morse, 1989). Informational redundancy was the primary criterion for completion of sample size (Lincoln & Guba, 1985). Data collection continued until "thick descriptions" were achieved and saturation occurred, that is, no new information was obtained (Lincoln & Guba, 1985; Morse, 1989).

A purposeful sample of seven patients was selected from the population of patients diagnosed with an AMI admitted to two large metropolitan hospitals in the Southwest United States. Patients who agreed to participate and who met the following criteria were considered for inclusion: (a) diagnosis of AMI confirmed by the physician, as noted in the patient's medical record; (b) alert and oriented to person, place, and time; (c) able to speak and read English fluently; (d) free from medical problems such as respiratory distress, cardiogenic shock, or other

problems that would preclude interviewing the patient; and (e) have experienced CP during his or her stay in the hospital.

Patients were interviewed within 72 hours after transfer from the CCU to a less intensive setting within the hospital. These criteria were selected to help limit the amount of stress that the patient was experiencing, decrease the role that denial may have played, and to improve the chance that the patient remembered his or her experience of CP clearly.

Human subjects protection

The participants' rights were protected by a number of methods:

1. The proposed research was approved by the Human Subjects Research Review Committee of Arizona State University and internal review boards at the sites for data collection prior to interviewing patients.

2. Participation in the study was voluntary. A member of the hospital staff gave potential participants a letter of invitation from the researcher which defined the general purpose and involvement of the study, and invited the patient to participate. The letter explained: (a) that more than one interview might be necessary and that the interviews would be audiotaped, (b) all of the information gathered will remain confidential with the investigator, (c) the report will not utilize identifying information (i.e., names), and (d) participation in the study involved minimal foreseeable risk or injury, and was completely voluntary (Appendix A). If the patient agreed to participate, the staff member notified the researcher and the researcher obtained written informed consent prior to the data

collection (Appendix B). The interviews were held in the subjects' hospital rooms.

Data collection procedures

Eight semi-structured, interactive interviews were utilized to obtain the data, with data collection becoming more focused during subsequent interviews as central themes or concepts emerged (Morse, 1989; Stern, 1980). "Qualitative fieldwork should be iterative; one pass at a site leads to a reshaping of ones' perspective and of one's instrumentation for the next pass" (Miles & Huberman, 1984, p. 63). The iterative process guided subsequent interview questions.

The interview process was guided by Spradley's (1979) ethnographic interview techniques. Since flexibility was essential, the list of initial interview questions in Appendix C, were used as a guide. The patients were asked open-ended, descriptive questions about their experiences with "CP". To avoid biasing patients' responses, patients were asked to describe the symptoms that brought them to the hospital and the researcher used the patient's words, instead of the term "chest pain" (Schneider, 1987).

The use of "grand tour questions" (Spradley, 1979, pp. 86-88) and the researcher's expression of ignorance about the subject, were used to establish rapport and help the researcher get a "feel" for the subject (Spradley, 1979). Grand tour questions set the tone for the interview and let the subject know what the interview is about (Brink, 1989). Effective communication techniques such as paraphrasing, probing, clarifying,

minimal verbal responses, and summarizing were used to facilitate the interview process (Okun, 1987).

Patient interviews were audiotaped and transcribed in their entirety. Additionally, brief field notes were taken during the interviews. These reflected significant nonverbal behavior of the patient, and any other pertinent data that was not reflected on the audiotape, for example, gestures and descriptive motions. As soon as possible after the interview, the researcher reviewed the tapes to ensure that the words were comprehensible, and that nothing had been left out. After transcription, the researcher reviewed the data by carefully reading through the transcribed data while simultaneously listening to the tapes. Any errors that were detected were immediately corrected.

The patient's chart was reviewed by the investigator, with emphasis on the presence of CP and the interventions utilized, and the patient's psychological responses to illness. Pertinent information was documented in a memo. Additionally, the investigator discussed the experience of pain, and the possibility of unreported pain, with nurses caring for AMI patients to elicit their perspectives. Information gained from the chart (e.g., patients' complaints of discomfort, and psychosocial concerns regarding their illness) and nurses' views enhanced the understanding of the pain experience, and served as a method of triangulating the data.

In order to adequately describe the sample, certain demographic data were obtained (Appendix D). These data were recorded as field notes and consisted of items such as sex, race, ethnicity, level of school completed,

and whether or not the patient or a member of the family had been previously hospitalized for heart disease.

Data Analysis

Data analysis is characterized by the "...simultaneous and ongoing collection, categorization, and interpretation of data..." (Sandelowski, Davis, & Harris, 1989, p. 79), known as the constant comparative method (Chenit & Swanson, 1986). Data from each interview, starting with the first two, were compared for similarities and differences and analyzed for patterns prior to conducting further interviews (Hutchinson, 1986). The information obtained through this process guided further interviews. As the themes emerged from the constant comparative analysis, the interviews became increasingly structured to assist in the validation of themes with subsequent informants.

Data were examined utilizing content analysis. Content analysis is a process which works to uncover the "manifest content" (Lincoln & Guba, 1985, p. 337) of the data, making the deeper meaning explicit. The exact words of the patient were the units of analysis. Ethnograph, V. 3.0, a computer program designed for qualitative research, was utilized to code the data with substantive codes, which reflected the actual substance of what was said. Mutually exclusive categories related to the factors influencing the reporting of the pain experience were then developed and a core variable, or basic psychological process (BSP), which explains the other variables, was identified.

Methodological Rigor

Validity, reliability, and objectivity are critical issues in the evaluation of quantitative research. Lincoln and Guba (1985) conceptualized methodological rigor for qualitative studies as establishing trustworthiness. The four criteria Lincoln and Guba (1985) developed to address the issue of trustworthiness will be discussed as follows: credibility, transferability, dependability, and confirmability.

Credibility

Credibility refers to having confidence in the "truth" of the findings (Lincoln & Guba, 1985). Of the techniques that Lincoln and Guba suggested for establishing credibility, peer debriefing and member checks were appropriate to this study and were utilized.

Peer debriefing involved the researcher sharing ideas and thought processes with a jury of peers and incorporating their feedback into the inductive analysis. This process helped to elucidate the thinking of the researcher and clarify concepts (Lincoln & Guba, 1985). This technique was accomplished informally through individual and group discussions with professional colleagues caring for AMI patients. Any significant data or insight gained from this process was written as a memo.

Member checks described the process of obtaining feedback from the subjects to verify data or conclusions. Member checks were accomplished throughout the data collection process and after data were collected (Lincoln & Guba, 1985). Member checks were accomplished by summarizing the data collected during the interview in a verbal or written form and asking the subject whether he or she felt that it was an accurate

description of what they said. Additionally, as categories and concepts emerged, subjects were provided with some of the relevant findings from previous interviews, and asked if they experienced the same feelings. To avoid biasing the subject's response this information was supplied at the end of their interview, or during subsequent interviews.

Additionally, a matrix analysis was utilized to help simplify data analysis and leave an audit trail which reflects how credibility was established (Marsh, 1990). Decision rules for the utilization of the matrix serve to clarify trustworthiness issues, as well (Marsh, 1990). The decision rules used in this study concerned the themes as they emerged and the assessment of the informants' responses as to their categorical "fit".

Transferability

Transferability is the generalizability of the findings. Lincoln and Guba (1985) suggest that it is not the researcher's task to establish transferability. The researcher's task is to provide "thick descriptions" which contain enough data that individuals wishing to apply the findings can evaluate the appropriateness of the generalizations for themselves. Theoretical sampling, the transcribed interviews, and memos that were written served as the basis for the "thick descriptions". If descriptions are "thick", the analysis should serve to generalize the emerging concepts to similar populations or situations.

Dependability

Dependability refers to the stability of the data over time and the ability to track the data as if one were following an audit trail (Lincoln &

Guba, 1985). This criterion was met by asking subjects the same questions, phrased somewhat differently, during the interview and noting whether their answer was the same. If discrepancies were noted, the subject was asked for further clarification. Additionally, peer debriefings and an external auditor reviewed the transcripts and memos. Similar conclusions drawn from the data enhanced the dependability of the results.

Confirmability

Confirmability refers to the objectivity of the data. Lincoln and Guba (1985) recommended a confirmability audit to meet this criterion. The audit process that was undertaken has been addressed under the heading of establishing dependability.

CHAPTER IV: RESULTS

Sample

The sample consisted of six men and one woman. Eight interviews were conducted (one subject was reinterviewed), resulting in 152 pages of data. The interviews were approximately 60-75 minutes in length. The subjects were drawn from two large private hospitals in a metropolitan city in the southwest, and ranged in age from 58-89 (mean=73.9). All of the subjects were Caucasian, and were either Protestant or Lutheran. Six of the seven subjects were married. The amount of formal education that they had completed ranged from the eighth grade to the twelfth grade (mean=11.4). Six of the subjects were retired. Five of the subjects held, or had previously held blue collar jobs, while the remaining two subjects had been employed in white collar jobs. The ethnic identity reported by the subjects included Scottish/Irish, Norwegian, Squaw Indian/German, and "American". Two of the subjects had previous AMIs and one additional subject had been hospitalized in the past with angina. Members of four of the subjects' families had coronary disease.

Findings

All of the subjects suffered a confirmed AMI, as evidenced by their physician's diagnosis documented in their medical record. Data gathered from the subjects and their medical records served as one method of triangulation (other methods of triangulation are presented in the final section of this chapter). Six of the seven subjects reported all episodes of discomfort that they experienced while they were in the hospital, as evidenced by their statements and a review of their medical record. However, four of these subjects did not report these symptoms

immediately, and instead, waited for varying lengths of time to see if the symptoms resolved spontaneously. One subject stated that he had chest discomfort which gradually diminished over the first two days of hospitalization. This continued discomfort was not reflected in his medical record. While the subjects were generally able to recall their experiences, certain details of their illness that were recorded in their medical records were not recalled, or were recalled only after probing questions.

The basic psychological process which emerged from the data is that of decision-making in response to the symptom of pain. The process occurred twice, once at the onset of the initial pain, leading to the hospitalization, and again when pain occurred during hospitalization. The decision-making process which led to reporting the symptoms elicited these themes: (a) The Experience of Pain, (b) Assessing the Pain, and (c) Taking Action. A schematic depiction of the pre-hospitalization decision-making process is described in Figure 1 below. A schematic depiction of the decision-making process during hospitalization is described in Figure 2, and precedes that section.

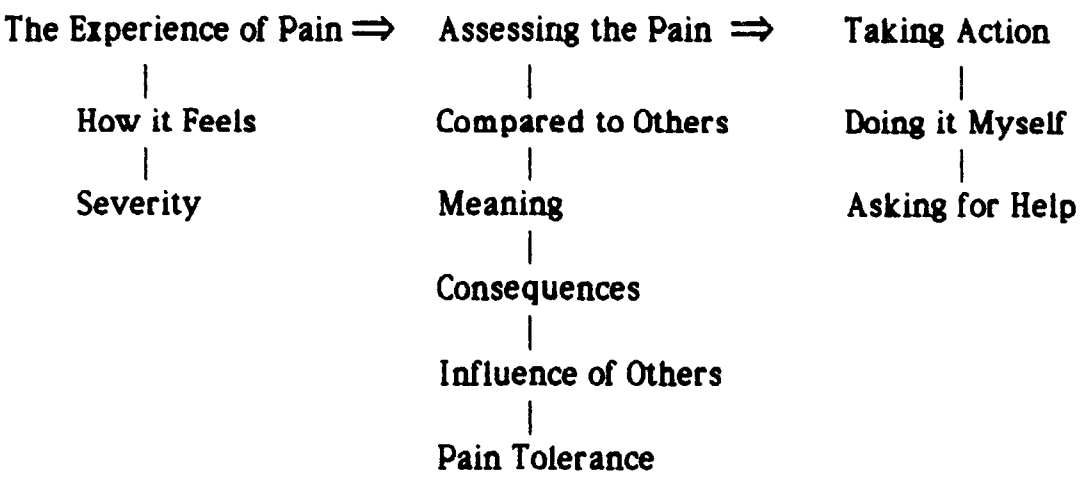

Figure 1. The reporting of chest pain pre-hospitalization

Pre-hospitalization Phase

The Experience of Pain

Although some aspects of their experiences with the discomfort of an AMI were similar, each subject had their own unique descriptions and perceptions of that experience. All of the subjects were at home when their symptoms began, and the symptoms were described as having a sudden onset. Two categories describing the experience of pain emerged from the data: (a) How it Feels, and (b) Severity.

How it Feels

The majority of the subjects described fairly classic signs and symptoms of an AMI, for example the "pressure feeling" subjects associated with indigestion and the need to eructate. However, the subjects without a previous diagnosis of coronary artery disease (CAD) did not necessarily recognize the symptoms as those related to heart disease. A few subjects experienced symptoms which were more atypical (e.g., abdominal pain, shortness of breath). One subject described symptoms

which he had experienced prior to his AMI, that were likely to be anginal in nature; however, he did not associate these symptoms with his present illness. The informants described how the pain felt in the following way(s):

Well, it's just that where they say it will hit, that's where it hits.

Right in the middle of the chest. I could feel pressure there and I'd go like this (put pressure on the area) you know, thinking it would help. Actually, I thought at first I had indigestion or something. Indigestion usually you could put pressure on it and it will help ease it a little, but it didn't. The pain just got worse and kind of spread out a little bit.

And I was sweating just like you said and I was freezing, but I was cold, but I was sweating, sweating, just pouring out of me.

It started around 1:00 pm. I started having gas pains, I thought.

It just started spreading going around 'till about here (mid-axillary line). Then it started going down my arms.

I just had this pressure inside my body trying to get out. It just felt like my chest was swelling up. And then, of course, after approximately 15-20 minutes, I began to get nausea.

It just seemed to work its way up. It started down under my ribs and worked its way up.

It was just a burning sensation. Sort of like your chest was filling up. Maybe a little short of breath. Things like that.

My heart "flumbered" in there. It was not right. I knew that.

When I came in the door last night the nurse grabbed me and I think for a couple of times I almost fainted on her.

I got home that night and I did not feel just the best.

It started out like my chest was getting full of gas and I would have to get it out of there. That is the way it started.

My elbows felt like they were going to sleep. Mostly the left. I have had it several times. I think it was a year ago that I noticed that a little bit.

And I said, "It's not my chest, it's back here, my neck and this shoulder and down below where my belly button is-where it is hurting.

It felt like I was in a vacuum and there was no where or no how I was going to turn to get any air.

Severity

The subjects were asked to describe their presenting symptoms (i.e., pain and discomfort) on a scale from zero to ten, with zero representing no discomfort, and ten representing the worst discomfort they could imagine. The severity of the symptoms, as described by the informants, ranged from mild to severe (3-10), with several subjects noting an increase in the severity of their symptoms as time elapsed. After medical interventions had been instituted by either the paramedics or emergency department personnel, the subjects described total or partial relief of their symptoms. One subject believed that his AMI occurred at the instant he experienced a cardiac arrest, and therefore related having had no pain at that moment. The severity of the pain was related by the informants:

I guess around three (pain when it started).

I guess maybe around a five (pain at its worst)

At the worst part when I was in here, was on your ten (pain scale).

I'd say about a five. If you rate it against the worst one. About the worst was five.

At the instant of the heart attack, I had absolutely no pain.

It bothered me enough so I finally gave up, and that would be eight or so (pain scale). I would say around eight.

It stayed eight a long time.

About 4:00 a.m. it started to get higher.

When I got in and they started doctoring me, you see, then it started to go down, down a little bit.

Most of the discomfort was gone by that time (arrival at the hospital).

I guess it was about a two or a three (upon ICU arrival).

The only thing that I had any kind of clue about was that ache in my arm. And that wasn't severe, it was just like a stomach ache now and then. It was just an ache. It wasn't a sharp pain or anything like that. It just ached.

To me, see I never had anything like that in my life. so, I'd say that was number ten for me. It was terrible.

I don't think I ever had any real ungodly discomfort or anything like that. It was just not the way you're supposed to feel.

> The strange part about it, I have never had any severe pains. I've had had aches, most of them just an ache in the left arm.
>
> As close as I can come, I'd say a five. Nothing severe, it just don't feel good-I'm miserable. I wasn't ready to start climbing any walls or anything like that.

Assessing the Pain

During the pre-hospital sequence, the subjects attempted to understand the etiology and significance of the symptoms. Subjects compared the experience with memories of their past experiences, and memories of discomfort reported by others. The majority of subjects initially attributed their symptoms to minor, common complaints, such as indigestion. These initial assessments were often revised as further cues became incongruent with these initial beliefs. Several subjects did not obtain relief from remedies that they had used for similar symptoms in the past, thus they began to believe that their present symptoms were somehow different from what they had previously experienced. Based upon their perception of the meaning of the discomfort, subjects drew different conclusions about the consequences of their symptoms. The influence of other individuals on this assessment process was noted in four subjects. Additionally, the informant's tolerance for pain emerged as a factor in their decision to act. Thus, five categories characterized the assessment process: (a) Compared to Others, (b) Meaning of Pain, (c) Consequences, (d) The Influence of Others, and (e) Pain Tolerance.

Compared to Others

In defining for themselves what their condition was, subjects compared themselves to other individuals that they knew. This process involved both upward and downward comparisons. In upward comparisons, the subjects decided that their condition was worse than that of others, while in downward comparisons, subjects believed that their condition was better than that of others. The preponderance of comparisons to other people were downward in nature. Additionally, subjects utilized these comparisons to evaluate their symptoms against past experiences that they had with pain or discomfort. The informants described these experiences:

> The fellow that took me here. He had it for four months like this. He is lucky to be alive. He had it four months like that. A long time. So, you can see that I am better off in a way than he is.

> Other people that have heart attacks and they are in severe pain and are doubled over about to pass out. I experienced none of that.

> Their attacks were more severe than mine (because I had less pain).

> My interpretation up till now of a heart attack is intense pain, very intense pain through your chest and all. This I did not have. A lot of people I have seen just keel over dead with a heart attack. That is

when it is 100% then. What I have experienced is minor as far as my estimation of a heart attack.

Now I wonder, how some poor fella is or a woman or a man is if they got one worse than I did. He (physician) seems to think mine was-that I'll be all right in time. There's a lot of them that had worse times.

And when they (paramedics) pin you right down, you just start feeling sorry for yourself and then you start saying, "What's the matter with you?" and then you really don't have all that much the matter with you. And that brings you back to your senses a little bit, I think.

I've always had this idea that when you have a heart attack, it's one of these heart-wrenching pains that you just can't stand. I've never had that.

That's what I thought about the first one (AMI). I couldn't imagine I was having a heart attack. It just didn't dawn on me. That's no way to have a heart attack (without severe pain)!

I think the worse pain I had in my life was the appendicitis. I doubled here right up. That is the worse pain.

I have had back pain. That is pretty uncomfortable. When your back is out, you just about hurt all over. I can stand the stomach pain a lot better than the back pain.

It hurts worse (than stomach pain). When you have pressure on the nerve in your back, that can be as severe as anything that I know of.

In the past I've had my vision to blur with my angina pain. This time, no.

I felt pretty good. I have had ten times worse pain my life than this. Appendicitis and stuff.

By that time (4-5 hours later when wife called paramedics), I was feeling a little bit better when they got here. It hurt up in the middle of my chest, which I don't normally have with this gas thing.

It was different in the sense that it would not go away. It just hung on and hurt. Normally, I could get rid of indigestion attacks with antacids.

And it had hit right then so I went in and I said I'm going to go lay down, I have indigestion or something. I couldn't figure it out. I said, well, I can swallow, so it couldn't be something that I was choking on.

Sometimes you get those heart-rending chest pains and they drive you crazy and all that. I didn't get those. I'm not complaining.

Well, the other ones that I had didn't seem to be inside as stressful as this one.

It was different because you know your stomach sticks out and it's just full of gas. Then as soon as you take baking soda and boy, I'll go, 'Buuuurp.' And, oh, I'll feel so great. I'll burp and it's all gone. But this one, no. This was terrible.

I didn't have any chest pain with it. I didn't have any pains down the arm or anything. I just felt like I just couldn't get no air.

A heart attack-they always say your chest is where it happens or it goes up and down your arm. I was lucky I never had that, but this other was enough to get me.

Usually when I took it (nitroglycerin), it seemed to ease it down enough to where I could go sit in a chair and relax and then maybe in ten to twenty minutes it would all kind of pass. But this wasn't going to pass.

But that's what I thought this could have been (shoulder pain from rheumatoid arthritis), see, and it's a heart attack.

> All the time, the pain was a little different than it had ever been before. Usually the pain (angina) was a pressure down. This time it was trying to come out.

Meaning of Pain

The three subjects with previously diagnosed CAD were quickly able to determine that their symptoms were related to their heart, although this did not necessarily lead them to seek early treatment. Two of the three subjects made statements reflective of denial in the assessment process, however, which is likely to have contributed to their delay in seeking medical care. Most of the subjects without a previous diagnosis of CAD expected an AMI to involve intense pain. Because they did not experience severe chest pain, several of the subjects expressed surprise in finding out that they had suffered an AMI. Some of the informants eventually began to suspect coronary problems because they experienced the symptoms in the middle of their chest, or because their spouse believed that their symptoms were cardiac related. Additionally, several of the subjects equated the severity of symptoms that they experienced with the amount of myocardial damage. The meaning of pain, which characterized the assessment theme was described as follows:

> I thought that that (gnawing feeling in his chest) was the start of a little trouble. For me to find out and have it checked and see what you can do about it.

I kind of felt the gnawing, and the gnawing, and felt that it must be the heart.

I had a sharp pain under my rib (2-3 years ago) and he (doctor) was undecided as to whether it had anything to do with my heart and he said that he would give me some nitro and to try one and if it does any good, he would maybe think that it was my heart. I took them and it did not do any good. So I decided that there was nothing wrong with my heart.

I haven't had to take a nitroglycerin in at least a week. When this first started, I thought I was having another angina attack.

It wasn't really any worse than some of the others (experiences with pain). I just think that it scared me because it was different. Actually, that pain (aneurysm) was worse than what this one was. But this one was in the heart area. I think that's what scared me and made me think it was stronger.

I had a bad feeling right here (middle of chest). My heart "flumbered" in there. It was not right. I knew that.

Heart pain. I had a bad feeling right there (middle of chest).

I really did not know that I had had a heart attack. I had had problems with my stomach for years. Gas pains and mostly they go away if you use an antacid. When this occurred, I played golf in the morning and I went home to have lunch, ate pizza.

The heart. Then I knew that something was wrong here.

I knew I was getting sore here (middle of chest). I hurt in my heart. I knew that something had to be done.

At least the doctors say I don't (have previous AMIs). To me, angina is a heart attack. Something is attacking you!

And every time I've had it, it's been the same identical thing again (AMI).

This time they brought me to the hospital because my symptoms were exactly the same as the other two times.

I just said, "Well, okay." I was about 9/10 leery that I had the same thing (AMI) over again. But I didn't want to admit it, I just didn't want to.

I had a very clear feeling inside of me that it was heart-related and I think that that did scare me.

I thought I was constipated.

They said it was a heart attack and I couldn't figure it out because I thought a heart attack, they say is always up here in your chest and then it will run down your arm.

If it went away, then I would have thought something just didn't agree with me.

Consequences

The informants considered the possible consequences of their illness and several of the subjects discussed the damage done to their heart, and the possibility of further damage. The focus, however, was the potentially fatal nature of an AMI, which was addressed by all of the subjects at some point during the interview. One subject, who experienced a cardiac arrest, described his near-death experience as a very peaceful feeling and stated that he did not fear death. The consequences considered by the informants are as follows:

And they actually thought it was better for him (husband) to bring me in here than wait for the paramedics because if they got there it would have killed another hour for them because I was hypertension and they want you to quit that and give you another thirty minutes there and another thirty minutes to wait.

By him doing that (husband bringing her to the hospital) it saved more pain and more damage by coming into the hospital.

The first time it started at home, I said, "There's more damage and the stronger it gets", and all those things just go right through you mind.

He (doctor) wants me to have a catheterization this Tuesday. He said that my heart is scarred on one side. Now what that is from, I don't know.

Anytime you injure the heart, you can lose your life, no question.

If that's death, I'll welcome it. Because the pain was gone, absolutely. I just seemed to be floating. No noise. I couldn't hear the doctor or the nurses conversing with each other. If they said anything, I don't know. And the other thing, I got out of it was I simply saw this fist coming right down on my chest. I knew what was happening, but I couldn't have stopped it or nothing.

I was perfectly lucid. I could say everything except when my heart tried to quit on me. That was euphoria. Everything was just so calm. But that is why I am not afraid of it a bit.

Anything to get rid of the pain, that's about all I thought of. I wasn't worried about death or anything of that sort, no.

I never worried about not recovering. I knew I would.

He thinks that I had a heart attack. If I don't get something done about it, I will have another.

It would have been a little bit easier on me if I had done it (gotten help) sooner. I don't know. Anyway, I made it.

They (staff) said if I hadn't came when I did it would have been worse.

I knew that I had heart trouble and did not know what to think whether I would pull out of it or not. I knew the doctors were going to do all they could, so that was as far as I could think. I'm getting old enough to die. You can't live forever.

I did not think so (that I would die) because I thought that they would do their doctoring and that I would be all right.

I did not think that really crossed my mind (dying)--[this fear was noted in his chart and had been previously mentioned by him].

Well, not knowing how many of these things you can survive, I wasn't even sure I was going to get to the hospital. Now that didn't cause me any panic or anything like that. I just wondered.

I was almost 90% sure that those bypasses had closed up again. And that was going to leave me with those choices again, whether to say, "The hell with it, I've had enough" or go ahead and clean them out again.

They told me that I had a heart attack and I thought of Dad and I wondered if I'm going to live through it or not.

I knew I wasn't going to stay in that house very long, not alive, anyway. I just knew that. Funny how you get those feelings.

I wasn't afraid that this was going to be like Redd Foxx always said, "the big one". I wasn't afraid that that's what it was and that I would die from it. I just had the hope that if it was something like this, that they'd get me there in time to get me the help because that's what I needed.

I don't know if I'm really different than anybody else. I just don't think I'm ever going to die.

Influence of Others

In the pre-hospital phase of their illness, four subjects noted the influence of others on their decision to seek medical attention. In each of these instances, the subject's spouse was the source of influence, and urged the subject to seek medical attention. Two of the subjects' spouses reportedly suspected a cardiac etiology for the symptoms.

She (wife) thought that I should go to the hospital. She called 911 and they came.

She (wife) always yells at me to go to the doctor or get medication or whatever it might be.

My husband brought me straight down and I was holding my chest and he said he knew I had something to do with my heart at that time. So instead of calling paramedics and beings I already had trouble with aneurysms and stuff like that, well, he said he knew it had something to do with the heart.

I went in there and pulled up a chair beside him and I started rubbing my arms. Well, when I did that he knew something was wrong. And then while he was doing that, I was holding my other hand on my chest and it wasn't doing any good so I had both of them, you know, just pressing on it and like that and he said, "Well, it's your heart".

And that's what he (husband) thought it was (aneurysm), trying to get the feeling and the blood circulating again. He was thinking it was blocked and it wasn't circulating.

She (wife) is so used to me having the gas attacks, that she does not think too much of them. After I finally got up out of the chair to lay on the bed, then she got to worrying about it, I suppose. She thought it

was a heart attack because she has had problems with her heart and she was afraid that something was going to happen to me. And she wanted me to get to the hospital.

I told my wife, "Well, I just don't know what I'm going to do." She said, "Well, I'm going to take you to the hospital."

She (wife) wanted me to get a doctor or something, but I'm usually stubborn enough that I do what I want to do anyway.

Pain Tolerance

Two subjects reported having a high pain tolerance, while the remainder of the subjects described their tolerance as "nil" to "average". It is important to note, however, that all except one of the subjects who described their pain tolerance as average or below, went on to make statements which reflected a higher level of pain tolerance than they had stated. Although subjects were not specifically asked for their definition of pain, several subjects made a point of doing so. They described "pain" as very intense, and labeled less intense feelings as "discomfort" or as an "ache". The high pain tolerance of the majority of subjects had subsequent implications for the actions that they chose to undertake in response to their symptoms:

Put it this way, according to your scale of one to ten, pain would be well above five. Lower than that is just discomfort.

If it doesn't hit a six, you're fine. But it was a six and just kept going up.

My idea of pain is just something that you want to scream about. It has to be rather intense before I would rate it very high. Most of my angina is just a discomfort.

A lot of people, they just burn themselves, or pinch themselves, or get a splinter or something, and that's pain. To me that's not pain.

This here (discomfort of AMI) is more of an ache than pain.

That's what my daughter was just saying, "You got one of the highest tolerance there is--that they had ever heard of pain-wise".

It (high pain tolerance) made a difference because the one I had when I had the aneurysm--that pain was a lot stronger. They wouldn't give me a one to ten (pain scale) because it was above it.

I've burnt my hands to where they should have been scarred and so they don't know how I could stand this, but I do have a high tolerance for pain.

It (high pain tolerance) was a factor because I'm so used to pain that anybody else that would have just a little bit of pain would call for help.

My pain tolerance is nil. I can tolerate a certain amount but I abhor pain.
I have sciatica constantly. So, you can see my tolerance to pain-I've had to develop some tolerance.

I just learn to live with it. I have had this pain in my right leg for almost 60 years.

I know that I have arthritis throughout my whole body, so I don't feel I should complain too much. I have learned to tolerate a certain amount of discomfort. But when I get a sharp pain, everybody knows it.

My pain tolerance is about average. A lot of times I don't do anything about it, but I hurt the same as anyone else.

There's some people that don't feel pain. I do feel pain, but I don't feel pain enough to cry at every little thing that comes up.

I'm probably the world's biggest sissy about thinking about pain. But, I can take it reasonably well if I have to. I'd like to.

I'm an awful baby when it comes to pain. I don't like it. But, I think it's probably somewhere around five before I start to complain.

Taking Action

The last theme in the decision-making process was Taking Action. To some degree, all of the subjects chose to treat themselves in the hope of resolving their symptoms. At the point that the subjects decided that their interventions were ineffective, or that their symptoms were severe enough to warrant help, they sought professional medical attention. Thus, the theme of taking action was characterized as: (a) Doing it Myself, and (b) Asking for Help.

Doing it Myself

All of the subjects tried individual interventions in an attempt to relieve their symptoms, and waited varying lengths of time before deciding that the interventions were not effective. The actions that the subjects undertook reflected their interpretation of the etiology of their symptoms, and included such things as taking nitroglycerin or antacids, and the use of rest. Many of the subjects' comments reflected self-reliance, and a reluctance to complain or disturb others with their problems.

That's really what kind of scared me, I guess, because I tried doing everything. I said now I'm going to try to keep from hypertension, relax my breathing and everything and when that didn't do any good,

it made it worse and of course your pain was worse and I have hypertension anyway and my blood pressure sky rockets anyhow.

My hands were numb, no feeling, no nothing and they were rubbing trying to get the blood circulating.

I started taking nitroglycerin. The first two tablets did no good whatsoever, so I went and got a younger recipe-prescription.

They gave me a routine you go through: three nitroglycerin tablets, five minutes apart and then wait another five minutes and see if the pain goes away. So, I go through it before I say anything to anybody.

I took several antacid tablets. They did not do much good.

I could not make them (gas pains) go away and I just laid around all afternoon until my wife called the medics.

I just laid around in the recliner chair most of the afternoon. Toward dusk is when we called the paramedics.

I would not have called them (medics). I would have toughed it out. I guess eventually I would have done something (if it had not gone away).

I laid down, but I didn't take a drop of medicine.

I did not want to wake the neighbors up. So, I thought I would just hang on and I hung on until 6:00 a.m. and I started up my car and drove over to my neighbors and I asked them to take me over here.

My wife gets a little upset. So if a minor pain comes on, well, I'll go sit down and take my nitroglycerin. Then I pick up a magazine to keep her from asking me questions. But when it gets serious, I'll let her know.

I took two enemas and it just kept getting worse, so I took a spoon of baking soda-thought maybe I could burp it out.

I just told her (wife) that I wasn't feeling so well and that I just wanted to sit there and rest a while.

At first I just said, "I'm not feeling so good and I want to sit here for awhile." I didn't mention what it was. I didn't want to bother my wife with it.

It it's only a mild thing, I just don't say anything about it. I maybe go sit down.

Asking for Help

The criteria identified by all of the subjects for deciding when to seek medical assistance were an increase in the severity of the symptoms, and the fact that the symptoms failed to resolve, despite interventions they had employed. The length of time between the onset of the symptoms and the request for professional help ranged from approximately 30 minutes to six hours. Two individuals called their physician's office and were instructed to call the paramedics. The remainder of the subjects were brought to the emergency department by their spouse or a friend. The decision to ask for help is supported by the respondents' statements:

> When you reach the point where you don't think it's going to go away, that's the time to get help, no matter who it is that gives you the help.

> A little worse, it wasn't getting any better-I think that's what finally decided me.

> When I went to the hospital, I knew that I needed some help.

> I should have called the medics, that is what I should have done, but I did not.

> So, I called the office and asked to talk to my doctor.

I knew it was time and I had to get somebody in the house to take care of me. So that's when I woke her (wife) up and got the paramedics.

I knew that I had to wake somebody up-even if I had to go to the next apartment, I would have woke them up.

I sat there and the longer I sat there, I began to think, "You know, this is silly. I might as well find out what it is."

We had this Cigna Health Plan. You could get emergency service through Cigna, but I would much rather have just talked to my own doctor about it. But I had a snowballs chance in hell of getting a hold of him. So, I finally had Doris call Cigna's emergency number. They said if it seemed to be life threatening, then call 911.

When I'm sick, I'm sick. I'd tell anybody. If I'd be in church or something, I'd want to get out of there. I wouldn't wait until church was out or anything. I'd go right now. I wouldn't be afraid to say anything when I'm sick.

If the thing had started to ease up at all, I don't think I would have said anything.

No, I did not know what to do. What could I do? I would not know how to take care of it.

I did not like to call the medics at night.

And then I decided, "Well, if it is that kind of a problem (AMI), the sooner I get to doing something about it, the better.

Hospitalization Phase

A schematic depiction of the decision-making process during hospitalization is presented in Figure 2.

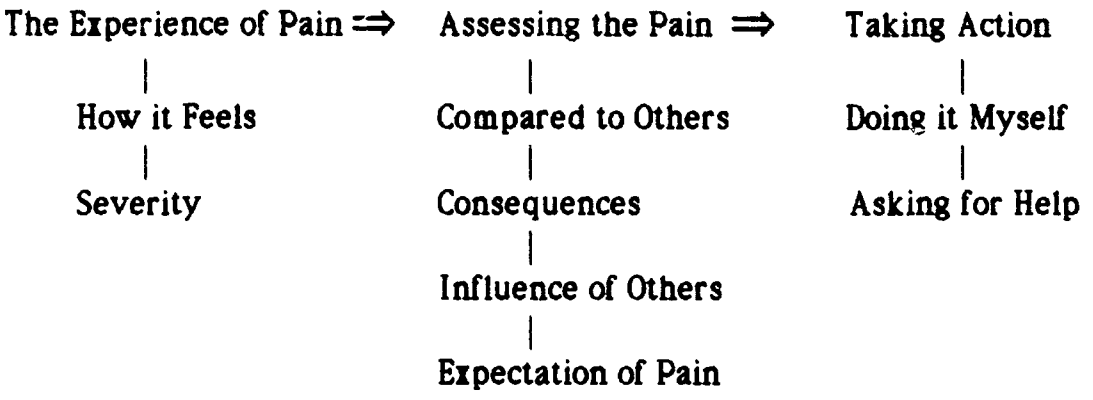

Figure 2. The reporting of chest pain during hospitalization

All seven of the subjects experienced pain while hospitalized. During the hospitalization phase, the decision-making process involved the same sequence as in the pre-hospitalization phase: (a) The Experience of Pain, (b) Assessing the Pain, and (c) Taking Action. Certain aspects of the process differed, however. Prior to experiencing further symptoms, each of the subjects were told that they had suffered an AMI. This information, coupled with the similarity in symptoms to what they had experienced at home, altered the perceptions of each of the subjects; particularly those who had not attributed their symptoms to their heart. All of the informants interpreted their subsequent symptoms as being

related to their heart. Pain tolerance was unaltered from the pre-hospitalization phase. Another important difference was that a few subjects' expectations of pain following an AMI appeared to influence their decisions. While the meaning of pain differed, the attitude toward Doing it Myself or Asking for Help was essentially unchanged.

The Experience of Pain

The first stage of the pain experience in the pre-hospitalization phase, the experience of pain, was reported by the informants in terms of how it felt and the severity of the symptoms. During the hospitalization phase, those same categories emerged.

How it Feels

In all cases, the symptoms noted by subjects while in the hospital, were similar to the complaints which brought them to the hospital. Despite a review of the medical records, it remained unclear whether or not the atypical symptoms experienced by a few of the subjects reflected ischemia or not. One subject complained of a headache which appeared to be induced by intravenous nitroglycerin, and also experienced nausea and abdominal pain, which was diagnosed as diverticulitis. The informants described their pain:

> Just a slight one and I think I caused that one which I didn't know you're not supposed to put your hands over the top of your head and exercise. Course I'm not used to laying in bed, I'm used to working ten hours a day and moving. And I hadn't slept in 24 hours and the next

night, I slept two hours in 24 hours. And I said, "Well, I'm not going to sleep", so I laid in bed and was doing exercises.

Maybe I moved or done something I shouldn't have and so it just kept getting stronger and stronger.

Well, it was just like the start of the other one. It was gone and the next thing you knew it was there.

Those first four days down below (CCU), I was so uncomfortable, I really couldn't tell you too much about what was going on. Not only did I have this problem in my chest, but I was also sick at my stomach-nausea.

I began to get nauseated. Before, the pressure always seemed to be outside just setting on my chest; this time the pain was inside-the same pressure, but it just felt like my chest was swelling up. And then, of course, after approximately about 15-20 minutes, I began to get nausea.

By the time they got me into ICU, the pain had let up to the point where all I had left- I knew it was still there. And at that time, the reason I say I think they fed me nitroglycerin through the IV, I had the damndest headache you ever heard of.

Only on the left side (abdominal pain). The doctors, they seemed to discount it relating to my heart. But to me, I don't know.

Severity

Although the symptoms were very similar to those the subjects experienced at home, the reported intensity was less severe (i.e., 2-7 on a 0-10 scale). This decreased severity of the symptoms may have reflected the therapeutic interventions which had been previously initiated, interventions instituted for complaints of pain, or a change in the environment.

I didn't hurt that much. I felt a little nauseated. That was about it.

A two or three (pain scale), something around there.

Not too much (discomfort in the hospital). It has been going down, down. I think it is disappearing, I do.

Very, very little (discomfort in the hospital). Once in a while they come and ask me what do I think-is it a five or six or more or less. I tell them probably there's a little gnawing in there, a four or five. Then they will check me.

But it only got to about a six because they started giving me nitroglycerin under the tongue and going from there, and gradually it

down and went around to the left side and it seems like it takes about three or four hours for that to go on that side.

The pain from the angina. It went away very slowly. When they started the intravenous, it must have been nitroglycerin, they never told me. Anyway, it eased up and gradually died out.

It took two days before I could say I was completely free from the angina. The residue was still there, particularly the nausea and the stomach. All the time I'm fighting to keep from heaving everything up.

The ache in my jaw and my arms, did not seem to last very long. But that could have been even into the second or third day, to me it didn't seem like a very long time.

I was getting along fine and they kept saying, "On a scale of one to ten"-I was down to about one or two, maybe. Then suddenly I was up to about five.

A couple of them I would have to say would be up like a seven.
[And how about the lowest ones?]
I'd say maybe like a two or three. But just enough to be uncomfortable a little bit.

Assessing the Pain

The assessment process subjects utilized during hospitalization was very similar to that utilized prior to hospitalization, however two clear differences were noted. Subjects were no longer uncertain about the etiology of their initial symptoms. All of the subjects had been informed by their physician that they had suffered an AMI, and believed the diagnosis to be valid. This knowledge influenced the subsequent perceptions of the subjects. Subjects believed that the symptoms they experienced in the hospital were cardiac-related and their ideas about the consequences of their symptoms were based upon this belief. Thus, the informants knew the pain was cardiac in origin and did not reflect on the meaning of the pain. Therefore, the distinction between the meaning of pain and the consequences became indistinguishable, and these categories were combined into the category, "Consequences". One subject continued to refer to his symptoms as indigestion, however, as he had prior to hospitalization. This subject had a long history of indigestion, and it is unclear whether his symptoms reflected coronary ischemia or not.

The second difference which emerged was the identity of the individual who influenced the subject's decision regarding what action to take. During the pre-hospitalization phase, the spouse was the source of influence, while during the hospitalization phase, the health care provider (HCP) (i.e., nurses and physicians) became influential.

The third difference involved the expectation of pain. Some of the subjects reported that they expected to have some discomfort following their AMI. No evidence was found which indicated a change in the pain

tolerance level described by the subjects from the pre-hospitalization phase to the hospitalization phase. Therefore, pain tolerance did not emerge as a category in the assessment of pain during hospitalization. Thus, the assessment of pain during hospitalization is presented in four sections: (a) Compared to Others, (b) Consequences, (c) the Influence of Others, and (d) the Expectation of Pain.

Compared to Others

As they did with their initial symptoms, subjects utilized upward and downward comparisons to help them interpret their pain and their condition. The informants compared their symptoms during hospitalization to the discomfort reported by other individuals. They also compared their symptoms to the discomfort that they had initially experienced.

> I know there are other patients that were in worse condition than I was. And you never know when somebody else really is going to need it (help from staff).

> I really did (feel that the other patients needed more of the nurses' time than I did). Because there were different times I got the feeling there more things I wanted to do, but you're not allowed to do on that floor.

> There are some in here that are pretty sick, I guess.

If you are actually sick, and if there is danger of your having a heart attack or relapse, I would say that any time you need a nurse, ring for her.

I think a lot of people wait too long too, you know. George P., he went down, did not know nothing.

I kind of thought that this is it for me. I don't know why it always happens to me and stuff like that, but I thought to myself, "Why can't I be like the other ones that ain't this way?"

It (lingering angina) was so different from what I was experiencing when I went into the hospital that I felt it was an improvement.

Consequences

While most subjects focused on the possibility of dying after the onset of their initial symptoms, once subjects were aware that they had had an AMI, they had a broader focus of concerns when the symptoms recurred. In addition to the possibility of death, subjects' concerns included: (a) a second AMI; (b) the possibility of requiring cardiac catheterization and coronary artery bypass surgery; (c) extending the length of their hospitalization, thereby increasing the cost; and (d) developing a chronic heart condition. These consequences are reflected in such statements as:

I was not feeling that bad, it was just a discomfort like it had been. When you lay in a hospital, I think your nerves are a little bit uptight anyhow.

It might be partly nerves but I am not worrying or anything. At least I try not to.

Well, I thought maybe I was having another heart attack. When you're laying in bed at night, that's when things start to enter your mind, maybe your heart was going bad or something or other.

"Not again". "Why me?"

No, it really can't be (another AMI).

I tried to sleep and it was there and it was in different movements that I made, like turning on one side, it would be stronger than if I laid on my back, so I thought, well, maybe that blood clot, I was cutting it off, it was pinching it off.

Dr. S. brought in the echo machine. Now I know enough about X-rays, I could see the problem in the heart. The left ventricle, instead of a smooth movement, wiggled-so I know that muscle was damaged.

Those things I guess enter your mind. I have seen guys fall over dead in a chair playing cards. You know what can happen if your heart stops. That is it then.

He explained it to me, but the heart, when I did the treadmill, my heart enlarged to a certain extent and then it went back down after the stress was off. That led him to believe that the heart was not getting the proper blood. The arteries are partially blocked. He wants to go in there and see just what it is (catheterization).

It's kind of iffy. He'll just have to go in there and see just what it is (catheterization).

Like today, I am not suffering at all. But that is not to say that it is going to go away. Tomorrow it might come back up. But, I doubt that it will. I am not saying that it won't come back.

I didn't really think that I would die. I just figured that this time it's going to give me enough time to get things arranged.

It can happen more than once, more than twice, so I figure well, I can go home, feel perfectly well, every test won't show nothing, but that doesn't mean I'm not going to have another one. So that's enough to tell me that when I get home, if I can get home, to get things straightened out, in order and then when He call me I'll be ready to go.

Just that I wasn't quite ready yet (to die). My one daughter's expecting again and I'd like to see the granddaughter or grandson and get to know all my grandchildren. I don't know. It's just something you're not ready for and yet, if it did happen, I mean it wasn't no worrying, because I figured, well, everybody's going to go and I'm not one of these that's going to be scared to death. I figure, well, it's time. God's put me here for a certain time to do something and evidently, I've done what I was put here to do and it's just time.

I thought if I have a heart attack here and they don't come then it's too bad.

Well, he didn't come right out and say it (that I had a second AMI), but then you know, I just didn't push that one like I did the first one. But he said that was the start of one. And they will know more when they run some tests on Monday. You know, just what kind of damage happened.

It couldn't be happening that fast if there was a blood clot and it was dissolved, but I says, it happened the first time that way, just all at once, all of a sudden. And I figured well, it could be just a second one because I hear there's a lot of them that's had two or three while they're in there trying to cure the first one. And the other thing I was hoping that they wouldn't have to operate and have a bypass or something like that.

I would have to see the doctor again, and go through something again.

I wanted to believe that it wasn't related to my heart. I was lying to myself. I know it because when it hits in the same place, you know it has to do with the same thing.

I wanted to believe it wasn't that (my heart).

I could get out of intensive care. The sooner you're out of intensive care, you know you're on recovery.

Just being in here and going through the tests that I have, you realize that your heart can be affected without being in extreme pressures that you can have.

If I can get out of here and get back home, and take care of myself, I am liable to have it for three or four years.

And then I got to thinking, well, maybe I'm just imagining this because it's so close to the other one.

And every time it would happen, that would delay my coming up here. I thought, "Am I ever going to get the hell out of this ICU?" You know, people, I don't know if everybody is like this, but I've always felt that when you hear of somebody in ICU, you don't know quite how to take

it. Are they going to make it or are they not going to make it? I kept fooling around having these spells and each time I'd get a little bit more worried thinking well, gee, maybe one of these times it will be like he says, 'the big one'.

They keep asking me if I have any pain any other place besides right here, like down my arm or something. And I don't. Maybe if I did have it down through here, like they say you should, maybe then I would be panicky and I would worry more.

Well, I mean, is it going to get worse, is it not going to get worse? What in the world is going on? Are they going to help me this time or aren't they going to help me?

Influence of Others

While four subjects' decisions about what action to take at home were influenced by their spouses, the decisions that resulted from the recurrence of symptoms in the hospital were influenced by HCPs. This influence was noted in some manner by each of the subjects. The HCP's influence took the form of the subjects' responses to instructions about reporting pain, the trust or skepticism subjects had of HCPs, and actions of the HCPs (exclusive of instructions about reporting pain), which can be viewed as either encouraging or discouraging subjects to report their symptoms.

Regardless of whether or not the subject promptly reported the occurrence of symptoms while in the hospital, each of the subjects clearly remembered either the doctor or the nurses having instructed them to report any further pain. The wording that the staff reportedly used differed somewhat in each case. Examples of instructions reported by subjects which encouraged the reporting of pain follow:

> They were telling me to let them know if I wasn't feeling good, because then they'll start checking. Now they do that.

> They told me if I was uncomfortable or if I was having any pain, to call.

> They says, any pain, they says, they don't care where it is and where it's at. They wanted to know about it right away.

> The doctor there told me to let him know what was bothering me. So, I explained to him what I was experiencing.

> They kept asking me, not only the doctor, but the nurses kept asking me, "If you have anything at all wrong, anything, let us know right away." And that's all I had on my mind.

Two informants reported that the tone of the instructions given by their physician was one of chastisement. While the negative tone of the

instructions could have discouraged these informants from reporting their symptoms, it did not. Both subjects followed their physician's instructions and immediately reported their pain:

> My doctor and the heart doctor both told me very outright, when you start having these episodes, I want you to tell them. And if you don't tell them, and it progresses worse, that's going to be your fault. And if you want to lay here in discomfort, then you lay here in discomfort. Otherwise, we're going to help you.

> The doctor told me, he says, "Now if anything changes at all, I want you to buzz the nurse right now. We want to know right now." I just felt like a kid getting a scolding. Boy, I done what he said, right now.

In discussing the actions of the doctors and nurses, it became evident that the majority of the subjects trusted the health care providers and felt safe in the hospital environment. The presence of the nurses, and to a lesser extent, physicians, contributed to the subjects' feelings of security. Subjects expressed gratitude that the staff was there was to take care of them, and that being in the hospital provided the means to get immediate help if they should experience further problems. Subjects' perceptions of security in the hospital environment and trust in the HCPs created an atmosphere which may have fostered communication and encouraged the honest reporting of feelings. It is interesting to note that one subject

reported that the staff became angry when she experienced chest pain and failed to report it for one hour.

And then the nurse came in after that all night every five minutes. I still wasn't sleeping very good and she'd ask me what I was feeling-if it was back. So, I mean there was somebody all night long there. It seemed like every five minutes she was there taking my blood pressure.

I was thinking "At least I'm glad I'm here and not at home-because they can catch it sooner. At least it wouldn't have to hit the ten. You can catch it before it gets worse. If it is, how much more damage is going to be done to my heart? So if I was in here, they could catch it and less damage was going to be done.

They put me back on my blood thinner because they thought well, maybe it was the clots, you know, that hadn't completely dissolved. They thought maybe that was it so they put me back on the IV and they gave me a shot of my blood thinner stuff again and stayed there until those nitroglycerin tablets started working again.

Then they all stayed right there until it quit.

I felt real good that I was there and that they could do something right away.

And a lot of times I just raised my head up instead of using the buzzer. And they'd come in and say, "Is there something I can do for you?" They were the best nurses.

My husband tried to raise my bed one night and couldn't figure out how to do it and I asked that one nurse. All the other nurses were helping other patients and the only one there was the one that was monitoring. She said, "I can't leave my station. I'll tell you how to do it". I mean they stay right there. That makes you feel a lot safer knowing that there's somebody there.

That is why we have doctors for, to get you going if they can.

I think he (doctor) knows what he is talking about. The evidence he found in the tests that they took showed that there was something there that was not right.

That's what they're here for-to give me relief. That's what I'm paying for.

The way I looked at it was, "Hey, I'm here in the hospital. What better place can you be for them to take care of you, you know?"

But still inside, I knew that at a snap of a finger if something started going wrong inside of me, somebody would be there right now to take

care of me, even though they're so busy they don't know what they're doing half of the time.

Cause there's no sense sitting up in the bed and hollering and pushing the button, cause you know that when the time comes, they're going to be there for you. Regardless of how busy they are.

I didn't even think about it (not reporting the pain) because I figured, now this is my life. And if I don't do what they say, what the hell sense is there to be in here?

Each one of them (staff) were mad at me because I didn't call them when it first started. So that's something I'll never do. If you get it, call, either that or you get everybody mad at you.

In contrast, one subject expressed skepticism of doctors, and demonstrated greatest annoyance with the lack of specific information regarding his condition. When he was first diagnosed as having angina five years ago, he stated that he went to the library and read everything that he could find on the subject.

I don't trust the doctors too much. They don't know a hell of a lot more than I do. They're guessing. One of my gripes about doctors- treat a patient like he's a moron. I ask a question and they beat around the bush. Talking them platitudes.

He (doctor) is one of them that don't tell you a damned thing unless you corner him.

He (doctor) said, "Well, you have some damage." How much damage, that's what I want to know. How much scar tissue is going to result? What should I do?

I do what the doctors recommend. I don't fight them on that. What I fight them on is lack of information. Then they tell me, "Don't get upset."

Additionally, HCPs were described as behaving in a manner which may have encouraged or discouraged the subjects' reporting of symptoms. When HCPs responded to complaints of discomfort by utilizing interventions that effectively relieved the subject's symptoms, subjects perceived the HCP as being responsive to their needs. The staff's questioning of subjects regarding how they felt was of particular significance. The HCPs' questions conveyed their concern and the importance of reporting symptoms. Several subjects chose to notify the staff of their discomfort by responding to such questions.

It (pain) only got to about a six because they started giving me nitroglycerin under the tongue.

I didn't have to (tell staff about pain). They asked me. Every time they came in. I described my pain like I did to you on a 1-10 scale.

He (doctor) asked how was my chest and I said, "Well, the discomfort is still there. Are you giving me some nitroglycerin?" He said that I was already getting it in the IV. He told me that they were feeding me Procardia through the IV. Periodically, they would come in and they would add a hypodermic to the IV. That must have been the beta block. I did not ask. That is their job.

They would be very careful about asking me. The minute they came into the room, they'd say, "Any pains, discomfort or anything?"

They were back in a few minutes. I think once they realized that it was getting any worse, they kept asking me pretty regularly. I don't think I had to call them and say, "I'm getting worse." They were pretty good downstairs.

The nurses come in the room and the first thing they ask you-"Any more pains? Any more symptoms at all?" Well, the easiest thing in the world would have been, "yeah."

They always asked me about it when they came in to check my blood pressure, and I said, "I didn't buzz you because everything seems to be fine."

The medication fixed me so I didn't have any more pain. And I'm sure tickled to death.

Of course, they brought me medicine. I had shots in the stomach. I don't know what all I had, but whatever they done, it seemed to take care of the problem.

Three subjects noted instances in which the HCP seemed non-responsive to their needs, or conveyed that their complaint was not of great importance. One additional subject noted the the HCPs' response to her complaints of CP was to reinsert the invasive lines that had previously been removed. Examples of HCP behavior which may have discouraged the reporting of pain follow:

She gave me sleeping pill. I had asked for a sleeping pill and they did not give me one and I couldn't get to sleep. She finally gave me one. I got quieted down and I guess in about 15 minutes I went to sleep.

They put the IV's and everything all back in again. I had them all out.

Basically, about all they (nurses) did was to come in and take my vital statistics and give me my medication and ask me how I was feeling. I guess they would go write it in my chart. The nurses themselves did not say a great deal to me.

Some doctor come and disappeared.

A couple times I remember telling them that (CP). And they did not do anything about it; even that heart doctor that was in one day and checked me. My regular doctor was in here one day and checked me. But I did not hear nothing about it.

I think I told her that I had gas on my stomach and that I needed something to put me to sleep. She had already gave me an aspirin and Zantac. It was a male nurse at the time. I never saw him any more and he was only there a short time. So he did not come back the second time that I called. He wasn't here when I rang for the nurse, he was already gone. I don't know what I told him. I think it was the aide that came in first and she was going to hunt up the nurse and something happened to her. I did not see her anymore. I lay there another half hour and finally rang again.

Expectation of Pain

The comments made by some of the subjects clearly identified that they believed that some continued discomfort in the hospital was expected as a natural consequence of having an AMI. It is also important to note that one subject believed that the staff members were aware of his pain because they knew that CP was present with an AMI:

I kind of figured that there would be some kind of lingering discomfort. Even now I wouldn't say that I have any pain, but there are times when I am not comfortable.

I knew that it would take some time for the medication to clear up my problem. I guess I didn't worry too much about it.

I kind of felt that I would have some (pain), but I didn't know what kind.

I can't remember saying anything (about chest discomfort) because I just took it for granted that they realized that I was having chest pains with a heart attack. They knew that I had a heart attack right there in the hospital. They knew that those are symptoms that go along with the heart attack.

Realizing why I had the angina, knowing that I have this hypertension problem, I knew that any kind of stress or strain would bring on angina. It never worried me much.

Taking Action

Doing it Myself and Asking for Help were the themes which emerged during both the hospitalization and pre-hospitalization phases. Subjects who were initially reluctant to report their discomfort to others and preferred to wait and see if the symptoms spontaneously resolved,

continued to respond in the same fashion while in the hospital. However, the restrictions involved in being a hospitalized patient (e.g., no access to medications such as nitroglycerin) forced the subjects to ask the staff for assistance in obtaining relief from their symptoms. Subjects who did not hesitate to report their symptoms and ask for help prior to admission continued to do so after being hospitalized. Only one subject expressed evidence of having a different attitude toward reporting at home versus in the hospital. Thus, the knowledge that they had experienced an AMI did not alter the usual reporting patterns of the majority of subjects. Subjects still tried to do it themselves and subsequently asked for help to obtain relief from their symptoms.

Doing it Myself

Despite being diagnosed with an AMI, six informants' attitudes toward caring for themselves versus asking for help remained unchanged. Five of the subjects stated that they preferred to help themselves, whenever possible, and not to disturb anyone. They were reluctant to complain, and felt that reporting their discomforts was only justified if the symptoms were severe, increased in intensity, or did not go away. One subject stated that it was easier for him to report his complaints in the hospital than at home. However, this subject was still reluctant to complain and did not report his symptoms immediately. Two of the subjects reported using relaxation and deep breathing in an attempt to resolve the symptoms, and most of the subjects stated that if the symptoms had gone away on their own, they would not have reported them to the staff. Only two of the

subjects expressed no hesitation about reporting their symptoms immediately.

I just lay quietly and tried to change my breathing so that I wouldn't use up a whole lot of oxygen-deep breathe-bring it in and out slowly so it would stay in longer. Maybe it would circulate and just kind of change my breathing habit and not moving so I wouldn't take up so much.

But I just laid there still and naturally held it and just tried to keep it so the heart wouldn't have to work that much harder.

Cutting off the flow or something, so I laid back on my back.

It made me mad because I didn't call them (delay of one hour).

Hoping maybe that (lying still) would have done it but it didn't do it.

And I said, "Well, I'll wait a little while". But I waited longer than what I really had intended to.

I did (choose to wait ten minutes) and then I just kept up the time going more and more because it didn't seem like, you know, it wasn't any worse. It was staying the same. It sounds silly, but you watch the clock at that time. You sit there and you watch the clock.

I'd sit there and watch the clock and said, "Well, ten more minutes, that would be twenty minutes." Then I'd say, "Well, she's coming at eleven. Wait until then." But then by 30 minutes, it started getting stronger. Ten minutes it was staying the same. Twenty minutes, it was getting stronger. 10:30 p.m., it was stronger yet, and then I figured that was it. I'm not going to let it get as bad as it was when I came here. That's what made me decide I didn't want it that bad. I was getting hot, my forehead was getting hot. I said I'm not going to break out in no sweat like I was before. And that's what really charged it. I said I'm not going to go through that pain again.

If it (pain) had gone away instead of getting stronger, I wouldn't have said anything. Because I just figure well, it's just something natural, to tell you the truth. I mean everybody is going to have a little bit of pain here and there. It would just be something that if I can handle that, I can handle anything when I get home. If it gets above that, why then I know I can't.

If it is not that bad for me, I forget about it.

I can't remember that I complained too much about chest pain because I recall they were feeding me nitroglycerin through the IV. It was just a dull discomfort. If it hadn't been for the nausea, I would have been good.

If it had been more intense, I probably would have complained. I probably would have asked why they didn't give me some relief. I can't take pain.

I may be wrong in my attitude, but I feel that I know when I need attention and when I don't.

You can't be bothering people all the time for nothing.

Well, if it got worse, then you would have to call them. You can get them in a minute. They don't seem to bother me any so I just let it go.

I hesitate to call, when there are a lot of people in here who are very sick. I use that as a last resort or when I feel that I have waited long enough and I can't do for myself, I finally call for her.

I know a lot of people that if they have a sore thumb, they will ring the nurse. That is not something I would do.

[When would it be okay not to report pain?]
If you just have imaginary hurts, which you do oft times, I think. There is a man across the hall that will ring the nurse for every little thing. When she no more than gets out of the room, he rings again. If they don't come, he starts yelling. I think that is going too far.

I would ring for the nurse, and if she did not come, I would try to do for myself.

I have been pretty much apt to let things go till I have to do something about it.

I don't often complain about my ills.

I mostly keep it (pain) to myself.

I have not called the nurse right away yet. I wait to see how it is coming out and if I want something, I will tell her a little bit of this and that, and if it is not that bad for me, I forget about it.

If it gets bad, then you have to do something. It would have to go all the way up to eight or nine before I would say anything.

I didn't think nothing about it (not telling staff about minor pain). You'd be a crybaby to tell them. If I am not feeling good and if I don't know enough to tell them, I better take what is coming.

You can open up your mouth right away if you want to, but what good does it do? I think you could wait awhile and see.

I figured about ten minutes, you know, or something like that, because I said, "She (nurse) said she was going to come back in at eleven and take my blood pressure and I'll just wait until she comes in then." Well, I just waited longer because it was after that before she did.

I just get out of bed and I lay down and relax. And they say if you take some deep breaths, it's got to go away sooner or later.

Asking for Help

The majority of subjects (n=5) asked for assistance only when they felt that they were unable to meet their own needs. As previously noted, subjects generally reported their discomforts if the symptoms increased in severity, or failed to resolve spontaneously. However, subjects who were reluctant to report their discomfort, expressed their symptoms in vague terms (e.g., "I don't feel right."), and waited approximately 15-60 minutes before notifying the staff. Three subjects reported their discomfort when questioned by the HCP. Two of the subjects who had expressed no reluctance to report their symptoms stated that they immediately notified the staff of their discomfort because of instructions to do so. These subjects expressed no qualms about reporting any type of discomfort outside of the hospital setting as well.

One additional factor emerged that had a direct bearing on asking for help. One subject noted that her lack of insurance may have had some bearing on her decision because complaints of pain would delay her

transfer out of the Coronary Care Unit and therefore increase the cost of hospitalization.

I said, that's stupid. Here you are laying in a hospital and that's what you're here for. Do something.

It just got stronger. It started out to nothing and when it got to about a six, then I knew, I don't care what I'm doing, it's getting stronger. So that's when I put the buzzer on and called the nurse in.

If a person is feeling good and you get up during the night and all of a sudden you're hurting, that is when you better tell them, right away. Don't wait.

You should tell them if you are not feeling good. They don't know if you ain't and you are laying here sleeping.

[Did you tell the staff right away when you had the discomfort?]
Oh yes. They would call the doctor and tell him what was going on. In the afternoon he would come and tell them nothing to worry about, that maybe it was a little gas or so.

If it had felt something like that moving in there, you know, I would tell the nurse. She would get hold of the doctor or something and she would help them.

I can call her if I want her. I guess I have had to call her once or twice, not much.

If I had to stay longer, I would tell them. I would tell them if I knew there was something wrong.

I never asked them, but I still think it (pain shots) was for my physical discomfort rather than the heart.

I told the nurse a couple of two things. That I had a little pain there and that they should let the doctor know.

Yes, a couple of times I remember telling them that (I had CP). And they did not do anything about it.

[How long was it from the time that the discomfort started to the time that you rang for the nurse?]
I guess maybe 15 minutes or so. It always seems longer when you are waiting for something.

I think I told her that I had gas on my stomach and that I needed something to put me to sleep. I lay there another half hour and finally rang again.

I asked for a couple of pain shots. It was basically because laying in that bed was so uncomfortable that I could not sleep.

I described it as nothing more than just discomfort. I guess that is why the doctors wrote into my chart that I did not complain about pain a lot.

If it started that high (six out of ten), I wouldn't have missed (reporting it immediately). But it just started out light just like the other one-the same thing, it just hit.

When you reach the point where you don't think its going to go away, that's the time to get help, no matter who it is that gives you the help.

I waited a while and them I rang the buzzer and finally someone came in. She said she'd tell the nurse and then turned the buzzer off and left. She didn't come and I buzzed it again and finally she came.

If you don't tell them anything, how would they know?

When they (staff) asked, "How is your chest?", I'd say, "Well, I don't feel right".

When I get a sharp pain, everybody knows it. I may not complain about my sharp pain, but I get hard to get along with.

At home, you've got to set an awful lot of things in motion. You know, if it's a false alarm, you feel like a fool. Here, they're trained to look into these things and they can tell you, "Hey, that's just a gas pain or something."

You always need to tell an aide, the nurse, somebody with a little more authority than an aide will be able to come in. Because if it gets up, progresses until a little bit further, then the nurse has to call the doctor and then he has to get involved either with orders on the phone or else come back in. No, you definitely have to tell somebody.

I told them right away and I didn't do it out of fear. I did it because I thought it was the best thing to do. Because that's what they said. As soon as it starts, tell them.

Yes, I had no insurance. I knew they was going to keep me up there longer (if I had pain) because that's what that cardiac arrest-that's what that section is for. They were going to keep me another day up there. I wasn't going to get down here. And the sooner I can get down here, the sooner I can get out of here, which would save me an extra day.

Well, it (money) really didn't influence me that much as to not tell them about the pain.

I wouldn't be afraid to tell them because I knew it would set me back, because they have to know these things in order to treat you and make you better.

Methodological Issues

The potential limitations of the study, use of peer debriefing, and triangulation of data are explicated below.

Potential Limitations

It is important to note that a limitation in the generalizability of this research may stem from the method of identifying potential subjects. One criterion for subject selection was that the individual experienced CP (or other ischemic symptoms) during his or her hospitalization. In general, the nursing staff members who acted as a liaison between the researcher and the patients with AMIs assessed whether the individual met the research criteria by reviewing the patients' medical records. In this manner, subjects who may have experienced pain but did not report any of the episodes were excluded. The informant who experienced unreported CP reflected an oversight in assuring that the patients met the research criteria. Thus, it is recommended that future studies delete the criterion of CP during hospitalization. Perhaps then, after the researcher has established a rapport with the informant, the possibility of unreported pain can be probed. Although the subsequent exclusion of many of the subjects will be time-consuming, this design will enhance the credibility of the results.

Additionally, as in all research, the potential exists for investigator bias. This potential for bias, may be enhanced in qualitative methodology because, "One of the most salient characteristics of qualitative research,

especially ethnography, is that the researcher is preeminently the research tool" (Borman, LeCompte, & Goetz, 1986, p. 43). In qualitative methodology, the researcher also acts as the filter and interpreter of the data, and thus, may bias the findings (Borman et al., 1986).

Finally, exploratory qualitative studies are not designed to test hypotheses. However, certain assumptions were made by the researcher regarding the study, which may have had an effect on the findings. The decision-making process which culminated in subjects reporting, or remaining silent, about the presence of symptoms was assumed to be a conscious and dynamic process. Secondly, in keeping with the theoretical framework selected for the study, the severity of the symptoms was believed to have influenced the decision. Additionally, as in most decisions, the author assumed that barriers and benefits (i.e., pros and cons) would play a part in the decision-making process. Thirdly, it was assumed that subjects would remember their episodes of CP and respond truthfully to the researcher's questions, once a rapport was established. Finally, in reviewing the informants' medical records, it was assumed that all episodes of pain that the patient verbally complained of, or that were discovered by the HCP through the assessment process, were documented.

Peer Debriefing

Discussions with nurses who care for patients with AMIs provided a rich source of data. All of the nurses reported the existence of unreported CP in their clinical practice, and several nurses expressed frustration with patients' failure to report their pain despite being instructed to do so. The nurses' anecdotal recollections and speculation about why some patients

do not report episodes of CP confirmed many of the researcher's findings (e.g., intensity of the pain, and waiting to see if the pain resolved spontaneously). Examples of the nurses' observations which were not substantiated in the current study included the idea that men are less likely than women to report their symptoms, and that patients with a previous diagnosis of coronary artery disease (CAD) report their symptoms sooner than patients who were previously unaware that they had CAD. The small sample size utilized may have hindered fully investigating these variables.

Triangulation of the Data

Knafl and Breitmayer (1989) astutely noted ambiguity concerning the term "triangulation", and pointed out that the term has two distinct applications. Triangulation may be utilized for its convergence (i.e., confirmatory) function, or in an effort to attain completeness (Knafl & Breitmayer, 1989). In this study, three types of triangulation were utilized: (a) investigator, (b) method, and (c) theory (Knafl & Breitmayer, 1989).

Investigator triangulation involved review of the research and subsequent feedback from each of the thesis committee members; particularly from the thesis committee chairperson (Ammon-Gaberson & Piantanida, 1988; Knafl & Breitmayer, 1989). This feedback was especially useful because of the broad range of expertise represented. The individuals comprising the committee have diverse backgrounds and research interests. Some of the members have research expertise in quantitative methodology, while others have expertise in qualitative

methodology. This wide array of expertise assisted in finely honing the results of the present research, and added credibility to the findings.

The triangulation of methods involved intensive interviews, discussions with nurses caring for patients with AMIs, and a review of each informant's medical records. The researcher reviewed the medical record after the initial interview, and then reinterviewed the subject to clarify any data or to discuss pertinent topics noted in the record that were not previously discussed. In particular, the informants' medical records were reviewed for complaints of discomfort, psychosocial issues related to their illness, pain-relieving interventions employed by the HCPs, and the presence or absence of electrocardiographic (EKG) changes reflective of ischemia or acute injury.

The physicians' progress notes and nurses' notes confirmed the informants' statements that they had (or had not) complained to the staff of discomfort, and what, if anything, was done in response to these complaints. In one instance, the medical record revealed that the subject was concerned about the cost of hospitalization because she did not have medical insurance. When the researcher questioned the informant further, this concern was confirmed, and added another piece to the puzzle that might have otherwise gone unnoticed.

Another data source was the presence of continuous electrocardiographic (EKG) monitoring. EKG monitoring can reveal the presence of myocardial ischemia or an acute injury pattern, both of which are frequently associated with CP (Johanson, Dungca, Hoffmeister, & Wells, 1985). All of the informants had EKG monitoring instituted at the time of

admission, and continued throughout their stay in CCU and on the telemetry unit. None of the informants' medical records reflected that EKG changes prompted the nurse to assess the subject for ischemic pain. In other words, the HCP's only knowledge of the informants' discomfort came from the subjects' spontaneous complaints, or in response to questioning by the HCP.

Theoretical triangulation was the final method utilized. A secondary literature review was conducted, focusing upon additional studies of patients with AMIs, pain of other etiologies, and related theoretical frameworks (e.g., social comparison theory, uncertainty, and illness behavior). The information contained in the literature reviewed supported several of the findings from the present study, and are discussed in Chapter Five.

CHAPTER V: DISCUSSION

The basic psychosocial process resulting from the data indicates that individuals experiencing the symptoms of an AMI engage in a process of decision-making under conditions of uncertainty. In illness behavior, the concern is what the individual will do in the presence of symptoms and why (Kasl & Cobb, 1966). The onset of the acute discomfort of the symptoms of an AMI in this cohort triggered a series of cognitive and behavioral events which culminated in their asking for help.

Mishel (1988) who's seminal work examined uncertainty in the context of the diagnosis of cancer, defined the concept as a state of cognition in which inadequate cues preclude appropriate adaptive behavior. The informants in this study dealt with the uncertainty by examining the external cues (i.e., the experiences of others in pain, and influence of others) and the internal cues (i.e., severity of the pain, comparisons with previous experiences with pain, and pain tolerance levels) to shape their individual decisions to respond to the pain.

The theoretical framework (the HBM) which underpins this study, is concerned with health and illness behavior and the variables which influence and contribute to those behaviors. While this study did not test the constructs or concepts inherent in the model, these conceptual indicators of health/illness behavior were clearly articulated in the process resulting from the acute pain of the AMI. For example, the construct psychological readiness to take action, inherent in the HBM, was articulated in the process during the first two stages. The informants experienced AMI pain, judged the severity by some internal mechanism, and proceeded to further assess the phenomenon. The processes of

assessing the pain that the informants experienced, which was characterized by several discrete categories, resulted in a "state of readiness" to act upon the experienced symptoms. Likewise, the concepts barriers and benefits, that is weighing the cost/benefit ratio of one's actions, was clearly analogous to the characterization of meaning and consequences of the pain in the data from this cohort.

The concept cue to action, which is the most poorly defined and least researched variable in the HBM, is analogous to several characteristic categories throughout the decision-making process. For example, cues were present in the severity of the pain experienced, in the assessment of the pain as compared to other experiences with pain, and in the encouragement of others to stimulate the informants to act on their symptoms. The complexity of the concept "cues" and the uncertainty in the literature concerning what a cue is, where it occurs in the process, and how potent a stimulus it is, is certainly evident in this study, as cues appear to be operational throughout the process.

In qualitative methodology, two sources of data contribute to the findings. The first is the subjective data source, the informants' verbal reflections of the experience or phenomenon. The second source is the objective findings from the literature, either as theoretical presentations or empirical data. In this study, a secondary literature search provided a variety of parallel findings to confirm and enhance the process as it emerged from the data.

The discussion of the decision-making process is presented according to the phases and stages explicated in the results chapter. The possible

role that denial played in the process is then analyzed. Implications for future research conclude the discussion.

Pre-Hospitalization Phase

The Experience of Pain

How it Feels

The experience of discomfort during hospitalization was very similar to the symptoms which brought these subjects to the hospital. The discomfort was sudden in onset and similar in quality to the informants' presenting symptoms.

Severity

The perceived severity of these subjects' symptoms was a key factor in their decision regarding what was wrong with them and whether profession medical assistance was required. The importance of the perceived severity on the decision to take action was supported by Baumann (1961) and Silverman (1987) who found that people with symptoms of illness sought medical attention when the symptoms became intolerable or resulted in some degree of disability. Hackett and Cassem (1969) demonstrated that the time of delay between the onset of symptoms and arrival at a medical facility tended to decrease as the perceived severity increased. However, the present study also supports the additional findings of Hackett and Cassem (1969), Silverman (1987), Bondestam et al. (1987), and Hofgren et al. (1988) who noted that the severity of the pain was only one part of the overall decision regarding the actions to be taken in response to the symptoms. Some of the

subjects in each of these studies experienced severe discomfort but did not seek immediate help.

Assessing the Pain

Compared to Others

The informants' comparisons of their discomfort to the experiences of others, and to their own previous experiences with discomfort, was clearly an important mechanism subjects utilized to help determine the meaning of their symptoms. The phenomenon of comparing oneself to others is known by social psychologists as "social comparisons" (Taylor, 1982). Social comparison theory was originally conceived by Festinger (1954) and has been repeatedly tested and refined since that time (Taylor, Buunk, & Aspinwall, 1990). Social comparison is now recognized as an important factor in the process of coping with stressful events (Taylor et al., 1990).

Social comparison theory originally proposed that social comparisons served the purpose of self-evaluation of one's opinions and abilities (Festinger, 1954). In this process, individuals compare themselves to a person who is similar to themselves, at least with regard to the dimension being evaluated (Wood, Taylor, & Lichtman, 1985). Individuals were thought to strive upward to improve their present capabilities and to appear more capable than the individual that they compared themselves to (Taylor et al., 1990). Further research identified that people use social comparisons for the purpose of self-enhancement, and to clarify their emotional reactions to stress and illness, in addition to its self-evaluative function (Wood et al., 1985).

Recent studies have demonstrated that people tend to utilize downward comparisons (compare themselves to others that they perceive to be in a worse situation) in stressful or victimizing situations (Taylor et al., 1990; Taylor & Lobel, 1989). The tendency to utilize downward comparisons was noted in the present research, and that of Johnson and Morse (1990). The majority of informants who verbalized evidence of social comparisons believed that they were better off than other individuals who had experienced severe pain or other problems associated with their AMI.

Additionally, the informants compared their initial symptoms to other experiences that they had had with pain. Some of these subjects believed that this was the worst pain that they had ever experienced, while others described experiences that they perceived to have been more painful.

Meaning of Pain

The meaning informants gave to their symptoms was crucial to their decisions regarding the actions to be taken. This relationship between the interpretation of symptoms and subsequent health behavior is well supported in the literature (Kasl & Cobb, 1966; Suchman, 1965). Ford (1989) noted that the symptoms of an AMI prevented individuals from continuing their activities. The significance of this is reflected in Apple's (1960) findings that laymen defined illness in terms of a recent onset of symptoms and interference with one's usual activities. Similarly, Baumann (1961) demonstrated that patients sought medical care due to some degree of disability. Thus, the informants' sudden onset of pain and

inability to carry on their normal activities was a potent cue that something was indeed wrong.

The informants who had previously been diagnosed as having coronary artery disease had no difficulty recognizing their symptoms as myocardial ischemia. However, because the symptoms were not severe at the onset, the majority of subjects who had not previously experienced coronary ischemia, initially attributed their symptoms to more mundane and less significant health problems, such as indigestion. One of the factors that emerged as a hindrance to the recognition of the symptoms as heart-related was the belief that AMIs always cause severe pain. The fact that an AMI may feel more like indigestion than crushing CP has important implications for patient teaching and public education. Although this information is generally included in educational material, perhaps it is not given sufficient emphasis. Denial is another possible explanation for the informants' failure to correctly interpret their ischemic symptoms. The possible role that denial may have played in the decision-making process will be explored in a later section.

Eventually, these subjects came to the conclusion that their present symptoms were in some way different from what they had previously experienced, and they were no longer able to normalize them. These findings are congruent with the results of previous studies. Mechanic (1972) asserted that people have the tendency to normalize or ignore symptoms as long as they are manageable and do not become too severe. Similarly, the subjects in Cowie's (1976) and Ford's (1989) studies did not initially appreciate the real meaning of the pain, but noted that the pain

was different, and unlike anything that they had previously experienced. Cowie (1976) also recognized that the subjects arrived at the diagnosis of AMI by default, after ruling out less serious complaints. Johnson and Morse (1990) noted the same decision-making process of attributing meaning to the symptoms, and interpreted the normalization of symptoms as a means of maintaining control. The issue of control is very germane to the present study, and the possible effects will be discussed in later sections.

Consequences

The importance of symptoms is not related to their existence, but to the threat that they represent (Friedson, 1970; Kirscht, 1974). The ultimate threat, that of death, was discussed by all of the subjects. It was not clear, however, whether the informants who had not recognized their symptoms as heart-related, considered the possibility of dying before arriving at the hospital, or only after being informed that they had suffered an AMI.

Influence of Others

In the present study, half of the informants' spouses were influential in the decision-making process. This finding is consistent with Rosenstock's (1974b) belief that interactions with individuals or events at each stage of the decision-making process influence the decisions that are subsequently made and the behaviors that are undertaken. Suchman (1965) noted that 74% of the subjects discussed their symptoms with someone else before they sought medical attention. Similarly, the research of Hackett and Cassem (1969), Cowie (1976), Silverman (1987),

and Johnson and Morse (1990) supported the significant role of other individuals, both family members and strangers, in the decision to seek help. Hackett and Cassem (1969) found that friends or strangers tended to be more influential than the subject's spouse in reducing the length of delay in seeking help. Conversely, Cowie (1976) noted the spouse's influence on the decision to seek help. The cues that alerted spouses to the problem were a change in the patient's color or the inability to perform normal activities (Cowie, 1976).

Pain Tolerance

Although pain tolerance has not specifically been addressed as factor in many of the health behavior decision-making models, its influence was quite apparent in the present study. Mechanic (1982) recognized the importance of pain tolerance, and included it as one of the three classes of variables that he believed defined the person and his or her evaluative process. The other two classes of variables in Mechanic's (1982) model were the knowledge, understanding, and cultural influences of the evaluator, and the extent to which the individual's needs prevented him from accepting a definition of illness.

The influence of a high level of pain tolerance was also reflected in Schneider's (1987) study. One of the reasons that the subjects in Schneider's (1987) study gave for failing to report their pain was their perception that the pain was not severe enough to take action. This perception was supported by this author's finding that several of the informants stated that they did not ask for help until the pain was severe.

Williams and Thorn (1989) demonstrated that informants' subjective pain intensity was more strongly related to the belief that their pain would be enduring, than to the actual duration of the pain. The perception of having control over an aversive stimulus has been shown to increase pain tolerance (Litt, 1988). It is therefore possible that as long as individuals have a tolerance level high enough to allow them to endure the pain, they perceive themselves as remaining in control. If the duration of pain is believed to be longer than one's perceived ability to tolerate it, the feeling of control may be lost.

The meta-analysis Fernandez and Turk (1989) conducted found that cognitive coping strategies had a positive effect in enhancing the pain threshold and pain tolerance of subjects over 85% of the time. Although none of the subjects specifically noted the use of cognitive coping strategies, this aspect of the pain experience was not probed. Thus, it is possible that these coping mechanisms were employed.

Taking Action

Doing It Myself

All of the informants made some type of attempt to resolve their symptoms without assistance, based upon their interpretation of the meaning of the symptoms. Cowie (1976) found that 19 of the 27 subjects used self-medication in response to their symptoms, and five of the subjects waited to see if the pain subsided on its own. While self-treatment may be thought of as an alternative to medical care, Kirscht (1974) considered self-treatment to be an integral part of medical care. Johnson and Morse (1990) noted patients' tendencies to help themselves

and concluded that individuals who were experiencing an AMI attempted to maintain control by keeping everything as normal as possible.

As previously noted, the perception of control over the symptoms may have decreased the subjects' appraisal of the threat. Experimental studies of pain have demonstrated that subjects who believe that they have control over the aversive stimulus perceive the stimulus to be less painful (Corah & Boffa, 1970; Glass et al., 1973; Litt, 1988). Conversely, the lack of control was associated with an increased reported of symptoms (Pennebaker et al., 1977).

Asking for Help

Some of the informants were clearly less hesitant than others to assume the sick role and fulfill their obligation to seek technically competent help (Parsons, 1951). The impetus to seek medical attention came from the perception that the pain was not going away despite the actions that the subjects had taken, and in fact, was getting worse. Cowie (1976) found the identical cues to action, which he termed the "critical incident". Kirscht (1974) noted that in severe conditions such as an AMI, barriers to seeking care became less important. This phenomenon was exemplified in the present study by the subject who had little money and no medical insurance, but sought medical care anyway.

The urging of others to seek help also contributed to the decision that something serious was indeed wrong and that medical attention was indicated. Hackett and Cassem (1969) noted, however, that individuals who needed the urging of others had a longer time of delay than individuals who decided to seek help on their own.

Hospitalization Phase

The Experience of Pain

How it Feels

Although some of the informants expected to have some type of further pain, a few of the subjects were clearly surprised by the recurrence of their symptoms. The subjects who expressed surprise, stated that they initially believed that they might be imagining their symptoms. Denial may also have played a part in informants' initial difficulty in believing that their symptoms had recurred.

Severity

Although the symptoms were the same or very similar to what they experienced at home, the reported severity of the symptoms these subjects experienced in the hospital was not as intense. Hofgren et al. (1988) also found that patients generally rated their pain at home higher than the pain they experienced in the hospital. This decrease in severity may have adversely affected the immediate reporting of symptoms, because several subjects recognized that although they were uncomfortable, they were feeling better than they had been prior to hospitalization.

Assessing the Pain

Compared to Others

The social comparison process that informants utilized prior to hospitalization was evident during hospitalization as well. Cowie (1976), Mullen (1978), Johnson and Morse (1990), and Compton (1991) all found that AMI patients compared themselves to others in order to predict their

condition and prognosis. As in the pre-hospitalization phase, downward comparisons were in the majority. Interestingly, informants who were in private rooms and had little or no access to knowledge about other patients, still utilized downward comparisons. Taylor et al. (1990) noted that studies of social comparisons suggest that in circumstances where an appropriate downward comparison target is not available, people have the ability to manufacture a less fortunate individual who serves the same purpose. Taylor et al. (1990) concluded that the selection of the comparison target is driven by the need to reach a predetermined conclusion in the comparison process.

Consequences

A few of the informants believed that the amount of pain they experienced was directly related to the amount of myocardial damage. Thus, they perceived less severe symptoms as less threatening. This misconception has important implications for the correct interpretation of symptoms and assessment of the consequences, and reflects a need for further patient education.

Influence of Others

The HCP was clearly influential in the decision-making process during hospitalization. Not surprisingly, all of the subjects were instructed by either a physician or nurse to report any episodes of pain. The chastising tone of the instructions reported by two informants, however, could have had an adverse effect on the reporting of symptoms. Therefore, if used at all, a negative tone should be used very cautiously and geared specifically to the individual.

The majority of subjects clearly trusted the HCPs and felt safe in the hospital, and especially in the CCU. This feeling of safety is supported by Compton's (1991) study of ICU patients, and Rowe and Weinert's (1987) study of patients in a CCU. The subject who was skeptical of HCPs was especially frustrated by the lack of information that he received. He had done extensive reading about coronary artery disease and was dissatisfied with vague descriptions of his condition and therapeutic interventions that were planned. Information seeking was clearly a coping mechanism for this gentleman, and this need was not being met.

It is of interest to note that one subject believed that the CCU staff was angry with her after she experienced CP and failed to report it for one hour. One explanation for this could be that the staff felt that the subject betrayed the trust they had in her to immediately report pain, as they had instructed her to do. Fear of an angry response, however, could prevent subjects from reporting their pain, or predispose them to lie about the length of time they have had the symptoms. This subject stated that if she had it to do again, when she notified the staff of her pain, she would have said that the pain had just returned.

The fact that three of the subjects mentioned incidences in which they perceived the HCP to be non-responsive to their needs or conveyed in some way that their symptoms were unimportant, is of concern. Although the symptoms that the subjects mentioned may not have been of great concern to their physical well-being, it is vitally important that patients feel that their concerns and complaints are taken seriously. If the

patients' concerns are ignored or given little attention, it is less likely that the individual will report their symptoms in the future.

Expectation of Pain

The expectation of a few of the subjects that some continued pain was a normal and expected part of an AMI is also of concern because this belief is likely to discourage reporting. This expectation seems likely to have been a factor in the failure of one subject to report his continued discomfort. This finding represents an area that requires further patient teaching. Patients should be told that while discomfort may or may not represent a problem that requires medical or nursing intervention, it is crucial to their health to report any discomfort, and to let the HCP properly evaluate it.

Another possibility is that the subjects did not expect to get total relief from their symptoms. This expectation was noted by Puntillo (1990, p. 530), who found that "most subjects neither expected nor received total pain relief during their ICU stays". Puntillo (1990) also noted that a few ICU patients believed that the monitors could detect their pain and alert the staff. While none of the subjects in this study admitted to this belief, when they were asked if the staff had some way of knowing that they were in pain without their verbal complaints, some of the patients were unsure whether or not this was possible.

Taking Action

Doing it Myself

The results of the present research are essentially analogous to Schneider's (1987) study of unreported CP. Although Schneider (1987)

noted a higher incidence of unreported CP than was found in the present study, the reasoning behind the failure to report CP was very similar. Schneider (1987) noted the following reasons for patients' silence: (a) pain was not severe enough, (b) did not want to bother the staff, (c) waited to see if pain went away on its own, (d) miscommunication regarding the word "pain", and (e) no reason. Data from the present study clearly support the first three reasons. No evidence was found that reflected the lack of reporting to be due to the use of the word "pain" in the instructions of the HCPs, although, in light of the definitions that subjects gave for "pain", it would appear that "discomfort" might be a more appropriate choice of words. Schneider's (1987) final category, "no reason" probably reflects the inability to elucidate the factors which resulted in the informants' decision to remain silent about their symptoms.

Johnson and Morse (1990) found that patients with AMIs did not report the recurrence of CP to the staff as part of a process of trying to prove that they were not seriously ill. Through this denial, patients were able to minimize the seriousness of the threat to their biological integrity.

Asking for Help

Parsons (1951) believed that cooperating with the HCP in the process of trying to regain one's health, was another obligation of the sick role. The belief in this obligation was evidenced in some manner by all of the informants, but especially by the two subjects who stated that they immediately reported their discomfort because of instructions by the HCP to do so.

The frequent and repeated questioning of the subjects regarding how they felt, encouraged the reporting of pain. Altice and Jamison (1989) noted that questioning patients about pain showed concern and demonstrated that complaints were acceptable. However, despite their diagnosis and the frequent questioning about pain, the majority of informants continued to report their pain only after waiting to see if it spontaneously resolved.

Additionally, research has demonstrated that nurses consider non-verbal behavior and physiological signs to be more reliable indicators of pain than verbal complaints (Holm et al., 1989; vonBaeyer et al., 1984). Despite this, none of the subjects received pain-relieving interventions based upon a nursing assessment of these indicators. Interventions were only instituted after the subjects verbally complained to the staff.

Denial

Statements made by some of the informants revealed the possibility of denial at various stages in the decision-making process. Froese, Vasquez, Cassem, and Hackett (1974, p. 137) defined denial as "the conscious or unconscious repudiation of all or a portion of the total available meaning of illness in order to allay anxiety and to minimize emotional stress". The authors viewed denial as a process by which other defense mechanisms (e.g., rationalizing, intellectualizing, displacing) could be employed, rather than as a specific defense mechanism in itself.

Cassem and Hackett (1977) noted the universality of fears about the heart, and Bragg (1975) asserted that the fear of death always accompanies an AMI. Given the severe degree of threat that an AMI poses, it is not

surprising that denial is the most common coping strategy (Cassem & Hackett, 1977). Mechanic (1982) noted that the likelihood of denial was increased in situations in which individuals did not have sufficient coping skills to deal with the fear. Mechanic (1986) went on to posit that successful coping often required creating the illusion that major changes have a limited impact.

Denial may have played a role in determining the meaning of the symptoms, the delay in arriving at the hospital, the decision to self-treat, and the delay in reporting pain while in the hospital. Denial is speculated to have affected subjects both with, and without, a previous diagnosis of CAD. For example, one subject stated that his symptoms were "identical" to and "exactly the same as" his two previous AMIs. The informant then went on to state that he was "9/10 leery" that it was another AMI, but he didn't want to admit it. Hackett and Cassem (1969) found that individuals who displaced their symptoms to other body parts besides their heart, tended to have a longer delay before arriving at a medical facility. Another informant stated that if the pain she experienced in the hospital had not been too intense and had gone away on its own, she would have decided that it was "something natural". "I was lying to myself. I know it because when it hits in the same place, you know it has to do with the same thing."

All of the subjects mentioned that they thought that they might die from the AMI, however, later in the interview, several informants denied that fear, or made statements which minimized the degree of fear they felt. It is likely that this reflects denial, however, the possibility exists that the

predominantly older male subjects simply did not want to appear afraid in front of a young female researcher.

In conclusion, both the experience of pain, and illness behavior, are multi-faceted phenomena. The results of this study supported the existence of unreported CP and described the process of decision-making in response to the symptoms of an AMI. Inherent in this decision-making process were themes that supported concepts inherent in the HBM. Decision-making occurring in two phases: (a) pre-hospitalization, and (b) hospitalization. Although the decision-making process utilized during these two phases was very similar, slightly differing themes emerged from the data. In general, the factors which encouraged the reporting of pain included: (a) the severe nature of the symptoms, (b) recognition that the symptoms were cardiac-related, (c) lack of relief from the symptoms despite self-treatment, (d) a low to moderate pain tolerance, (e) severe perceived consequences, and (f) the influence of others. Factors which discouraged, or may have discouraged, the reporting of CP included: (a) the expectation that AMIs involved severe pain, (b) attribution of the symptoms to minor health problems, (c) a high pain tolerance, (d) the decision to self-treat and wait to see if the symptoms resolved, (e) the reluctance to bother others, (f) the diminished severity of the pain as compared to their initial symptoms, (g) the belief that some continued pain after hospitalization was normal and expected, (h) actions of HCPs which were perceived by informants as unresponsive the their needs or reflected that their complaints were insignificant, and (i) denial. Thus, the reporting of pain (or failure to report pain) is influenced by a variety of internal and external cues.

Implications for Nursing and Future Research

The proper management of acute pain requires an understanding of the complexity of the pain experience, and an appreciation for the diverse factors that determine its expression (Chapman, 1986). The present research adds to the body of knowledge regarding the experience of pain and its expression by describing patients' perceptions of AMI pain and elucidating the complex decision-making process resulting in the course of action taken. This information may help health care professionals to better understand AMI pain from the patient's perspective, as well as the factors that influence patients to report, or not to report, their pain.

The findings of the present study suggest that a number of factors enter into the decision to report, or remain silent, about CP. Factors which may discourage reporting and are likely to be amenable to intervention by the HCP include: (a) the belief that an AMI always causes severe pain and that the intensity of the pain is linearly equated to the amount of myocardial damage sustained; (b) the expectation that continued pain is normal; (c) the belief that the staff can tell when the patient is having pain without the individual's verbal complaints; (d) the HCP's failure to provide the information requested by the patient concerning his or her condition; (e) behavior by the HCP which the patient perceives as ignoring his complaints or treating his symptoms as insignificant; (f) the HCP's utilization of the word "CP" in instructions regarding reporting; (g) the HCP's utilization of a chastizing tone when instructing patients to report symptoms; (h) the HCP conveying anger or frustration with a patient for failing to report immediately report symptoms; and (i) the HCP's failure to explain to the

patient that interventions utilized to control discomfort are based upon the patient's response, and that interventions such as medications may be altered, or changed altogether, if they do not effectively control the discomfort. Factors which may discourage reporting but are not likely to be amenable to intervention by the HCP include: (a) a patient's high pain tolerance, (b) a patient's strongly ingrained belief that one should not bother others or complain of pain unless it is severe or incapacitating, (c) denial, and (d) a strong lack of trust in HCPs.

Despite the limitations of the present study, and the utilization of a small, homogeneous sample, the consistent support for the findings in the literature adds to the credibility of the present study. It is recommended that further studies of the decision-making process in response to the symptoms of an AMI be conducted on subjects with varying demographic backgrounds. Similarly, research utilizing subjects with pain associated with a non-cardiac etiology is likely to broaden our understanding. In addition, studies which further define the role that the HCP plays in encouraging or discouraging the reporting of symptoms may prove to very beneficial. Human responses to illness and hospitalization are complex and involve many intertwined variables. As additional research further elucidates the decision-making process people utilize in response to symptoms, the interventions that HCPs can employ to assist individuals in maximizing their health will become more apparent.

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APPENDIX A

LETTER OF INVITATION

Dear Patient,

My name is Judy Schwartz and I am a graduate student at Arizona State University, working toward my Master's degree in critical care nursing. I am talking with patients who have just had a heart attack to find out about their discomforts, and the factors that influence them to tell others about it. I am looking for patients who are willing to share their experiences with me, and I would greatly appreciate your help. I hope that the information I gain from this study will help health care professionals to better understand the experience from the patient's perspective.

Your participation is strictly voluntary and involves minimal risks to you. These risks include possible anxiety and discomfort if talking about your heart attack is difficult or troublesome for you. Participation in this study will involve a tape-recorded interview lasting approximately 60-90 minutes, a review of your medical records, and may involve a shorter, follow-up interview in your home or by telephone, after your discharge. The results of the study may be published, but your name or identity will not be revealed, and all information will be held confidential. Whether you choose to participate or not will not effect your care in any way.

Any questions regarding this study, or your participation in it, will be answered by Ms. Schwartz at 731-9567 or Dr. Keller at 965-3244. If you have any questions about your rights as a subject, you may contact the Chair of the Human Subjects Research Review Committee at Arizona State University, through Carol Jablonski at 965-2170.

Best wishes for a speedy recovery!

Sincerely,

Judy Schwartz

APPENDIX B

LETTER CONSENT

Letter Consent

Dear Patient:

My name is Judy Schwartz and I am a graduate student under the direction of Dr. Keller in the College of Nursing at Arizona State University. I am conducting a research study entitled "Variables Affecting the Reporting of Pain Following an Acute Myocardial Infarction". The purpose of the research is to gain a better understanding of what influences patients to tell, or not to tell, others about the discomforts they have as a result of their heart attack.

Your participation will involve: (a) a tape-recorded interview within 72 hours after you leave the Coronary Care Unit, lasting approximately 60-90 minutes; (b) a review of your medical records; and (c) possibly, a shorter, follow-up interview conducted in your home, or by telephone, after your discharge. The tapes will be erased as soon as the information is transcribed. Confidentiality of your records will be maintained by assigning a number (code) rather than using your name. No one except for me will have access to information about you.

I understand that my participation in this study is voluntary and that there are minimal risks involved. These risks include possible anxiety and discomfort if talking about your heart attack is difficult or troublesome for you. If there are any questions that make you feel uncomfortable, you need not answer them. If you choose not to participate, or to withdraw from the study at any time, it will not affect your care. The results of the research may be published, but your name will not be used.

Although there may be no direct benefit to you, the possible benefit of your participation includes assisting health care workers to better understand the discomfort associated with a heart attack and to develop methods to enhance the comfort of these patients.

If you have any questions concerning the research study, please call me at 731-9567 or Dr. Keller at 965-3244.

If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through Carol Jablonski, at (602) 965-2170.

I give my consent to participate in the above study.

_____ _____

Signature Date

APPENDIX C

INTERVIEW GUIDE

Interview Guide

1. I have worked with cardiac patients for many years, but I have never had a heart attack or any serious discomfort, so I do not really know what it is like. I would like to understand the experience of discomfort and the decisions made about it from your perspective. Would you please tell me everything you possibly can about what caused you to think that something was wrong?
2. On a scale from zero to ten, with zero being no discomfort and ten being the worst pain you can imagine, how would you rate your _____ (patient's words for CP)?
3. What did you do to relieve the _____?
4. What made you decide to come to the hospital?
5. Now I would like for us to talk about experiences you have had since you arrived at the hospital. Have you had _____ since you came to the hospital?
6. In what ways were the symptoms similar to, or different from, the symptoms that brought you to the hospital?
7. What was going through your mind when you experienced _____?
8. How did you feel?
9. What did you think that your _____ meant?
10. Was anyone else with you when you experienced _____?
11. What was happening on the unit when you experienced _____?
12. What did you do when you experienced _____?
13. Did you tell anyone about it?
14. What went into your decision to tell (not to tell)?

15. On the same scale from zero to ten, how would you rate this episode?
16. What did you believe would happen if you did (or did not) report the _____?
17. How did you feel about your decision to report (not to report) the _____?
18. When is it okay not to report pain?
19. When is it okay to report pain?
20. In general, how would you describe your tolerance to pain?
21. How does the _____ you had with your heart attack compare with other experiences you have had with discomfort?
22. Is there anything else that you feel that I should know about your experience with _____?

APPENDIX D

DEMOGRAPHIC DATA

Demographic Data

1. Age
2. Sex
3. Race: a) Anglo b) Black c) Hispanic d) Native American e) Asian-American f) Other _____
4. Ethnic background
5. Religious preference: a) Catholic b) Jewish c) Protestant d) Latter Day Saint e) Other _____
6. Previous hospitalizations for suspected heart problems?
7. Family members hospitalized previously for suspected heart problems?
8. Level of school completed:

Less than seventh grade	1
Ninth grade	2
Tenth or eleventh grade	3
High school graduate	4
At least one year of college or specialized training	5
College or university graduate	6
Graduate degree	7

9. Subject's occupation